PB81-214249

Brokering Emission Reduction Credits
A Handbook

(U.S.) Environmental Protection Agency
Washington, DC

Jan 81

U.S. Department of Commerce
National Technical Information Service
NTIS

50272-101

REPORT DOCUMENTATION PAGE

1. REPORT NO. EPA 230/3-81-002

2.

3. Recipient's Accession No. PB81 214249

4. Title and Subtitle

BROKERING EMISSION REDUCTION CREDITS

5. Report Date - Date of Issue
January 1981

6.

7. Author(s)
Regulatory Reform Staff, Controlled Trading Project

8. Performing Organization Rept. No.

9. Performing Organization Name and Address

Regulatory Reform Staff
Controlled Trading Project (PM-223)
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address

Box 9

13. Type of Report & Period Covered
HANDBOOK

14.

15. Supplementary Notes

Papers presented at conference on Brokering Emission Reduction Credits
January 26, 1981, Washington Hilton Hotel

16. Abstract (Limit: 200 words)

Controlled trading allows industry and individuals to profit from pollution control by allowing plants to decrease emissions below required levels and obtain state-approved credit for the reductions. They can then use these emission reduction credits (ERCs) themselves or sell them to other firms. Most firms, however, are busy running their ongoing businesses and are unaware of the potential cost savings they can achieve through EPA's Controlled Trading program. Brokers can assist these firms in recognizing and realizing the potential for cost savings. In January 1981, EPA sponsored a conference on brokering emission reduction credits. Over 200 environmental engineers, consultants, venture capitalists, plant managers, industrial location specialists, accountants and lawyers attended to learn more about this new business opportunity. EPA compiled a handbook on Brokering Emission Reduction Credits to help these and other prospective brokers get started. The Brokers' Handbook includes: a description of EPA's Controlled Trading Program; an examination of the potential benefits available to firms contemplating ERC transactions and exploration of the many services ERC brokers could perform; a case study of one California firm's brokering experience; an examination of how brokers can determine supply and demand for ERCs and for brokers in a given area; a discussion of options trading in ERCs; and an examination of tax considerations related to the financing, creation, banking, and use of ERCs.

17. Document Analysis a. Descriptors

b. Identifiers/Open-Ended Terms

Regulatory Reform
Controlled Trading
Brokering
Bubble Policy
Offset Policy
Banking
Emission Reduction Credits
EPA Conference
Air pollution; market in

c. COSATI Field/Group

18. Availability Statement:
No restriction
Available from NTIS, Springfield, VA 22161

19. Security Class (This Report)
UNCLASSIFIED

20. Security Class (This Page)
UNCLASSIFIED

21. No. of Pages

22. Price

EPA 230/3-81-002

PB81-214249

BROKERING EMISSION REDUCTION CREDITS

A HANDBOOK

Regulatory Reform Staff
Controlled Trading Project (PM-223)
U.S. Environmental Protection Agency

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA 22161

EPA 230/3-81-002

BROKERING EMISSION REDUCTION CREDITS

Table of Contents

Topic .... Section

INTRODUCTION 1

OVERVIEW OF BANKING AND TRADING 2

OVERVIEW OF PRIVATE TRADING 3

CASE HISTORY 4

MARKET ANALYSIS 5

FINANCING EMISSION REDUCTION CREDITS 6

OPTIONS TRADING 7

TAX IMPLICATIONS OF BROKERING 8

SUPPLEMENTAL INFORMATION 9

a. Bubble Policy Fact Sheet
b. Expenditures to Create and Purchase Offsets
c. Summary of Bubble, Offset, and Banking Transactions
c. Washington Post Editorial - Selling the Right to Pollute
d. Wall Street Journal Advertisement - Emission Reductions for Sale
e. Contacts For More Information

Controlled Trading

What it is— why we need it

The EPA has begun encouraging states to adopt a series of "controlled trading" steps to speed progress towards clean air with less expense and administrative hassle. Since 1970 EPA and the states have sought better air quality through rules which apply specific, uniform emission limits -- generally based on a known feasible control technology -- to every emission point within a regulated process. That approach produced large gains in many areas, because it dealt with sources that were easy targets, whose initial costs of control were relatively low. But for many urban basins and more intractable pollutants, it has left us far from attainment of ambient air standards. Now we face more difficult problems -- and the possibility that past gains may slow or be reversed.

There are several reasons for this. First, air is limited, while our population, production and industrial base will continue to grow. The atmosphere cannot expand; the more dirt we put into it, the dirtier it will get. Second, rules are general statements that can't fit every case. They leave plant managers little room to adjust broad requirements to particular situations. And they treat similar processes equally, ignoring both different impacts on air quality, and the chance that equivalent emission reductions might be more easily obtained from other processes in the same facility or area. Because some sources are undercontrolled under this approach, while many are controlled more than they need be, the result is excess costs -- and a powerful reason for industry to try to limit its obligations by resistance or delay. Finally, and most importantly, the present system discourages innovative control technology. A source that installs known controls can generally count on keeping enforcers off its back, regardless of those controls' cost or effectiveness. A source that develops more effective measures receives no reward for doing so. Worse yet, it risks making itself a target for extra regulation, since it may have shown its industry can do more. For most firms, it is simply not "profitable" to invest in innovative efforts to do more than the law currently requires. This point is critical, for in the long run only innovation can produce improved air quality at reduced -- rather than increasing -- costs.

Present regulation can deal with these threats to air quality in two ways. It can try to squeeze more emission reductions out of regulated sources, imposing much heavier costs per pound than for initial reductions. Or it can reach out to regulate smaller

---

For further information on controlled trading, please contact:

Michael Levin
Chief, Regulatory Reform Staff
Office of Planning and Evaluation
Environmental Protection Agency
401 M Street, S.W. (PM-223)
Washington, D.C. 20460
(202) 287-0750

sources. Both tactics mean more government intrusion and enforcement burdens, as well as smaller payoffs per regulatory action. Both mean more industry resistance and politicial problems. Both pose direct conflicts between growth and clean air.

Controlled trading offers a way out of this trap by putting the profit motive to work *for* pollution control, *within* the present regulatory system. Most generally, it would allow any source to meet its emission control responsibilities by securing required reductions from any points within its own or other facilities, so long as air quality and the enforceability of the resulting trade in levels of control remain equivalent. If a source can find or finance ways to remove twice the amount of a relevant pollutant at $5 per pound -- either within its own plant or from neighboring plants -- it can halve the $10 pounds it is now required to remove. In short, it can trade a relaxation of controls where control costs are very high, for increased controls where costs -- either of internal reduction or external purchase -- are relatively low.

Thus controlled trading allows a source to get someone else -- or some other process -- to meet required emission reductions. And a market for those reductions will let sources *anticipate* their availability and cost, creating greater certainty and more reductions.

This simple step can carry large benefits. *First,* as studies of existing sources under the bubble indicate, it can yield savings of millions of dollars, without adverse impacts on ambient air quality. Plant managers who produce such savings by redistributing controls will continue to search for further inexpensive reductions -- and will have a personal stake in the new configuration, instead of viewing controls as an interference imposed from outside.

Second, controlled trading builds on the plant-specific expertise which control agencies can never duplicate. Instead of stopping with enforcement of a uniform rule, it encourages plant managers to tailor nationwide requirements by counter-proposing a different mix of controls that will produce the same result. Since no *intrasource* trade will take place unless savings are realized, and no *intersource* trade will take place unless both parties benefit, this leaves state agencies free to focus on technical air quality while reducing wrangles over industry costs.

Third, controlled trading makes it profitable -- for the first time -- for firms to innovate by controlling more than required. Sources which produce such extra emission reductions can benefit by using them for a cost-cutting bubble, or selling them at a profit to new plants in need of offsets. These benefits can be magnified by banking, which creates a continuous incentive for firms to control as far as possible when replacing current controls, by allowing such firms to store reductions for future use or sale.

Banking also provides innovation insurance for existing sources, which can secure offsets to make up the difference if a new method of pollution control falls short of applicable requirements.

Fourth, controlled trading encourages voluntary extra reductions by regulated and unregulated sources. The prospect of substantial savings or profits can induce many firms to install controls that would be difficult to mandate by direct regulation. The prospect can also induce effective but difficult to require process changes. And it can make further reduction feasible for those low-control-cost but low-profit sectors of the economy that have often been treated lightly under State plans.

Finally, controlled trading can ease political and administrative pressures on hard-pressed State air agencies. It injects needed flexibility into the regulatory process, enlisting industry as an ally rather than an adversary. It can sharply reduce compliance costs, without changing the way emission obligations are set and enforced. It offers a route to attainment which does not involve additional direct regulation. With banking, it can spread permit approvals over time, relieve pressures to find offsets during politically-charged new source reviews, and help communities plan for growth based on known amounts of emission credits. It gives enforcement agencies something positive to distribute, not additional obligations. And it reverses present incentives for industry to delay rather than speed negotiations. A source which can benefit from a trade is losing money each day that trade is delayed, and will do everything possible to assure a prompt resolution.

Controlled trading currently consists of the bubble, new source offsets, and banking. EPA is exploring other steps -- including marketable permits and methods of allocating the clean air increment in so-called PSD areas -- that would expand the universe of traders and trades, provided that air quality and enforceability are preserved. The important point is that these steps, like the existing ones, will give sources a range of ways to meet air pollution requirements as cheaply and efficiently as possible, and that they must reinforce each other -- and environmental goals -- alike.

LEGAL FOUNDATIONS OF MARKETS IN AIR POLLUTION REDUCTION RIGHTS

John S. Hoffman
Strategic Studies Staff
U. S. EPA, Energy Policy Division
Washington, D. C.

The viewpoints expressed in this paper do not necessarily represent EPA's views.

President Gladollar had just received Chief Environmental Engineer Cleansweep's "unusual" report, which suggested that their company, UNITED UNIVERSAL, INC., spend half a million dollars more on air pollution control than necessary to meet recently promulgated state air pollution regulations for their No. #2, #3, and #4 manufacturing, painting, and assembly lines for Widgets. Having survived the apolexy possible in reading the first page of the report, Gladollar read on, thinking that either he was going to have to fire the poor boy or give him a mandatory vacation. However, the report began to make more sense as it continued; a method to Cleansweep's madness did seem to exist. That crazy engineer planned to sell some of the "surplus" emission reductions he would "produce" for a profit, to "bubble" some of the surplus reductions, to hold some to gain a future expansion permit, and even to take a "flyer" by holding some reductions for speculative profit!! Gladollar was pleased to see his best engineer thinking of ways to make money, but this proposal still seemed very, very strange.

6

President Gladollar Calls His Lawyer

Not being one to waste time, Gladollar picked up his phone and called his lawyer, Mr. Sharpeyes, who instantly suggested a meeting of all the Principals, including the company's controller, Carefellow. Within a few minutes time the meeting was convening in Gladollar's spacious office overlooking the bay. A brown haze obstructed the view.

The Meeting

Gladollar anticipated a few minutes of wry amusement. He turned to his Chief Engineer and, chuckling, asked him who was going to buy "clean air"? When Cleansweep replied immediately that a broker had obtained an unofficial offer from Cosmic Connections for 30% of United Universal's surplus Emission Reductions at a price twice the cost, Gladollar's mood began to change from a haughty sense of fun to a deeper and more profound enjoyment.

President Gladollar: Are you telling me that they would pay us money for this thing? Why?

Engineer Cleansweep: Because, apparently, Cosmic Connections plans to make a major expansion this year. Under the Clean Air Act, they need to obtain a construction and operating permit to do that. To obtain that permit they need to obtain reductions in emissions from an existing source that go beyond the reductions required in the State Implementation Plan. And, I guess, they simply can't produce those reductions as cheaply as we can.

President Gladollar: So you're saying that since we can make these reductions cheaper, we can sell them to Cosmic Connections so they can get their permit. That's incredible, but is it really legal?

Lawyer Sharpeyes: Well it certainly is. Offsets have been part of the Clean Air Act since 1976. Over 650 have taken place in this state alone. Most companies have produced and used their own emission reductions, but a few have bought them from other firms. One right here in this county.

Controller Carefellow: Okay, but even if we can get a firm contract from Cosmic Connections, why put new equipment in all our plants? Changing one process would provide sufficient reductions to make that sale. Why control more?

Engineer Cheapcontrol: Because we can bank the emission reductions, holding some of them for our own future offsets, using some for a bubble, and holding some for future sales. My cost estimates show...

President Gladollar: Now hold on a minute. Cleansweep, what's this banking stuff?

Engineer Cleansweep: Banking is a new state program that allows you to get credit for qualified surplus emission reductions in the form of an Emission Reduction Credit or "ERC" as its called. You can save, sell or buy it just like any other commodity, subject, of course, to some government rules, but it's still valuable...

President Gladollar: Now hold your horses, Cleansweep. Are you saying that we own these emissions, so that if we reduce them we own the air left over?

Engineer Cleansweep: Well, that's not exactly... Its more like, well.., - Sharpeyes, why don't you explain.

Lawyer Sharpeyes: Sure, Jim. Look we don't own emissions and we don't own the air. What has happened is that the state has taken advantage of an opportunity under the Clean Air Act, a federal law, to create property rights useful in certain administrative and regulatory activities that the state has undertaken to meet that federal law. We don't own the physical emission reductions, which makes sense, since it's hard to possess something that disappears when we create it. (Ha, Ha).

Gladollar chuckles - Everyone else is silent.

What we can own is an Emission Reduction Credit, a creation of rules of the State Implementation Plan, created by the state as a convenience to managing society's common air resources. Our rights to use the ERC, sell it, even hold it, are all set down in that state rule.

President Gladollar: You mean if we want to increase our pollution again we can't automatically do it?

Lawyer Sharpeyes: That's right Sam. The ERC can only be created by going through a set of regulatory activities of qualifying, quantifying, and perfecting our claim. We've got to show that our proposal would result in a real surplus reduction uncalled for in the State Plan, a reduction that is both permanent and enforceable. Once the state qualifies, quantifies and accepts our proposal it would then make us an offer, so to speak, of a new enforcement agreement. If we exercise that agreement, we are on the hook. We get an ERC and a new compliance agreement. To change that agreement we have to - and I'd like to emphasize that this is absolutely required - go to the Regulatory Agency and apply, through a "trade-off" procedure, for a change in the compliance agreement. If on balance our ERC is sufficient to meet all the air quality tests, then the agreement can be changed. If not, we're out of luck.

President Gladollar: So what you are saying is that every creation or use is like a regulatory activity, and we're not able to do anything we like.

Lawyer Sharpeyes: Exactly. Of course, as you know from the size of our legal staff, we are never free to do exactly what we like. Any property right we have at best gives us a limited bundle of privileges and obligations. Property rights never give unlimited licenses to do whatever we want. We can't build without zoning; we can't drive our trucks without licenses; we must operate our plant according to safety rules. In that sense an ERC is no different than any other property right. It's just a new one, with a different set of obligations and responsibilities than we are familiar with.

President Gladollar: You're not kidding. Tell me what else is so unusual about it.

Lawyer Sharpeyes: Well, for one thing, it contains some of the seeds of its own destruction—sort of an automatic inflation index.

Engineer Cleansweep: A what?

Lawyer Sharpeyes: Well, built into the ERC is a pre-defined manner for shrinking its usefulness. This was mandated by part of the Clean Air Act that required states to have the ability to revise their plans as necessary for any of a number of reasons. When an ERC is created it achieves its legal status to meet Clean Air Act requirements by being part of the State Plan, which includes a rather elaborate accounting system to relate pollution from sources like us to ambient air concentrations over this region. All the regulations passed are intended to bring total areawide emissions down to a level compatible with clean air. Now suppose there is a miscalculation. The air doesn't get cleaned up as scheduled by law. Then, we have the ERCs around threatening to dump even more pollution into it. What should we do?

Everyone is blank.

Well, we need a plan that will reduce emissions even more —we need more emission limits. The problem is that the ERCs themselves could be so large that they alone would prevent attainment, so we need some method of adjusting their value. Federal law allows the state to choose the method as long as it conforms to the law. Some states choose moratoriums - you can't use it until the air is clean, not very good for the owner who wants to do something now. Other states choose percentage adjustments-which is what our state chose. In that case, if the state rolls back emissions 20% overall, we lose 20% of our ERC.

Controller Carefellow: Without compensation? Why that sounds unconstitutional.

Lawyer Sharpeyes: Not at all, Mark. Remember it's an inherent part of the way the ERC right is defined. No one else is taking something from us — the states would just be exercising a conditional clause in our contract, so to speak. The adjustment is a rule of the game we agree to when we play. Really, it's the best feature of the whole system, because we know exactly where we will stand if something happens.

That's what we are after in every contract.

President Gladollar: Cleansweep, suppose we get an adjustment of 20% downwards; how much would the remainder appreciate?

Engineer Cleansweep: I don't know exactly, but I'd imagine quite a bit. Don't forget we have new regulations to meet - everyone would. The cost of new and additional regulation is likely to be higher than the cost of past ones. In general, the air agency has chosen the cheapest ones first. Also, we would have 80% of the ERC left — other firms might have to do what we did for the ERC under a new regulation and get no credit at all. I'd say we'd have to be ahead.

Controller Carefellow: Okay. But why bank now instead of later?

Engineer Cleansweep: Well, besides possibly losing our opportunity to bank, if we don't bank now, we will have to put on the control equipment to meet the existing regulation, equipment that will be useless if we decide to go to our solventless production process that would produce the extra reductions. Why not just go straight to the different process right away? Sure, it's more expensive in the first phase, but when you take into account the value of ERC and the cost of losing the control equipment if we decide to get extra control, it's a lot cheaper in the long run, and I think better. You know, the price of solvents ain't coming down.

President Gladollar: Well, explain your ideas for using the ERC.

Engineer Cleansweep: About 30% we sell immediately, — I think we could even sell an option that would provide our upfront financing. 20% of the ERC, I think, could be used for our own new source permit, if we install a new painting operation for integrating the mini-widget production here next year, instead of over in Cowtown. 25% of the ERC we can apply in a bubble trade-off. You know, instead of putting on a required control next year to comply with the new emission limit that is coming up for our pre-fabing operation, we can use the ERC to comply with that limit. The pre-fab operation has six years of life left, maximum. To control emissions for that period of time would mean writing the control equipment off in a third of its useful life. We can't afford to replace the pre-fab immediately, not with the technological breakthroughs I see coming. But we can bubble. The bubble will save us time and money and leave our options open. Finally, I believe we should hold the rest of the ERC. It will be worth alot - why not take a chance on it to make some appreciation.

President Gladollar: Cleansweep, you sound awful optimistic. Dealing with anything new is pretty dangerous. Murphy's law. Still, your basic thinking sounds awfully good. This financial report you did, though, was really terrible — no internal rate of return is listed, no breakdown on cost, or timing. Get together with Carefellow and work out one of our normal capital budget requests. Sharpeyes, I want you to do a detailed memo on the legal issues you think are relevant — I want you to be generating the questions, not just the answers. Well gentlemen, it looks like we may be able to do some business. I've got a Board meeting, so I'll be seeing you later.

President Gladollar gets up and leaves.

Lawyer Sharpeyes: Congratulations, Cleansweep. It looks like you may finally make us money.

Controller Carefellow: AMEN.

Epilogue.

On May 30, 1981 a transaction was completed between United Universal and Cosmic Connections for the sale of 200 tons per year hydrocarbon ERC. A note in United Universal's Annual Report indicated an extraordinary one time profit of a two hundred thousand dollars. President Gladollar was very happy; Engineer Cleansweep was given a very large bonus and promoted to Vice President of Engineering.

PRIVATE TRADING OF EMISSION REDUCTION CREDITS

Prepared by:

ICF Incorporated
1850 K Street, N.W.
Washington, D.C. 20006

in conjunction with

Controlled Trading Project
Regulatory Reform Staff
U.S. Environmental Protection Agency

By buying and selling emission reduction credits (ERCS), firms can significantly reduce their costs of meeting air quality requirements. This manual examines the potential benefits available to firms contemplating ERC transactions. The manual emphasizes the many opportunities available to ERC brokers -- firms or individuals providing necessary services to firms buying and selling ERCs in order to reduce their costs of pollution control.

TABLE OF CONTENTS

Section	Page
1. PRIVATE TRADING OF EMISSION REDUCTION CREDITS	1
1.1 The Uses of Banked ERCs	1
1.2 The Role of Banking	2
1.3 The Role of Private Trading	4
1.4 Evaluating Alternative Trading Systems	6
1.5 The Advantages and Disadvantages of Private Trading	6
1.6 Scope of this Manual	8
2. THE ROLE OF BROKERS IN TRADING ERCS	9
2.1 Who Might Become a Broker?	9
2.2 Functions Performed by Brokers	10
2.3 Legal Status and Duties of Brokers	14
2.4 The ERC Broker as Agent	15
2.5 Compensation for Brokers	16
2.6 Dealers and Brokers -- Dealers	16
3. THE ROLE OF A PUBLIC AGENCY IN PRIVATE TRADING	19
3.1 Providing an Information Clearinghouse	19
3.2 Providing Guidance About Brokerage Agreements	21
3.3 Establishing a Price Disclosure Mechanism	22
3.4 Acting as a Broker	24
3.5 Coordinating with Other Brokers	25
4. ADMINISTERING PRIVATE TRADING	28
4.1 Staffing	28
4.2 Financing	28
4.3 Arranging On-Going Publicity	29

LIST OF EXHIBITS

Exhibit		Page
1-1	Creation and Uses of ERCS: Emmission Offsets and the Bubble	2
1-2	The Use of Brokers Can Make Private Trading More Efficient	5
2-1	Roles of Brokers in ERC Banking and Trading	12
3-1	Developing an Integrated Banking and Trading Program	20
3-2	Program Elements and Interrelationships	26

PRIVATE TRADING OF EMISSION REDUCTION CREDITS

By establishing an emission reduction banking and trading program, communities can take an important step toward minimizing the costs of achieving air quality goals. A banking and trading program allows firms to receive credit for reducing their emissions beyond the level required in the state implementation plan. Firms creating "emission reduction credits" (ERCs) hold a potentially valuable resource. ERCs can be "banked" or stored, used to reduce the costs of meeting air pollution control requirements or sold to another firm for a profit.

Through the banking and trading program, firms can reduce the costs of achieving the required levels of pollution control. Minimizing pollution control expenditures will enable industry to shift scarce capital resources to increased production. From the community's perspective, the program promotes a healthy economic environment without compromising efforts to achieve a healthy physical environment. Banking and trading is an important part of EPA's Controlled Trading initiatives.

The need for banking and trading can be traced to the inherent limits in our existing regulatory program in which EPA and states set specific emission limits for classes of polluting sources. Although these emission limits reflect cost considerations, they are necessarily based on average or model facilities. Because of differences in the age and operating characteristics of industrial facilities, a wide variance typically exists in the costs of clean-up within a specific source category. And an even greater variance in con- trol costs exists across different industries emitting the same pollutant.

The goal of a banking and trading system is to encourage the maximum clean-up at those emission points where control costs are relatively inexpensive. For example, a firm that can reduce its emissions beyond current requirements at a cost of $250/ton can get credit for doing so and can earn a return on this investment by selling these emissions reduction credits to a firm that can only achieve required reductions at a higher cost.

1.1 THE USES OF BANKED ERCS

A banking and trading program offers firms considerably more flexibility in developing a compliance plan to meet air pollution control requirements. Instead of simply determining the technology, fuel or process changes required to achieve an emission limit, firms now have the opportunity to consider two important additional options:

(1) whether to invest in more controls than required in order to create and bank an emission reduction credit either for current or future use or sale; and

(2) whether buying ERCs from another firm would be a less expensive means of compliance.

In deciding how to comply with an emission limitation, firms will want to carefully compare their costs of control at different emission points within their own facilities and to the costs of control of other firms. Thus, pollution control requirements can be examined in the same manner as other factors of production (e.g., land, labor, and raw materials) and firms can use banking and trading to minimize their costs.

ERCs can be used by firms wherever a substitute emission reduction is a permissible means of achieving compliance. (See Exhibit 1-1.) The three specific uses of ERCs are:

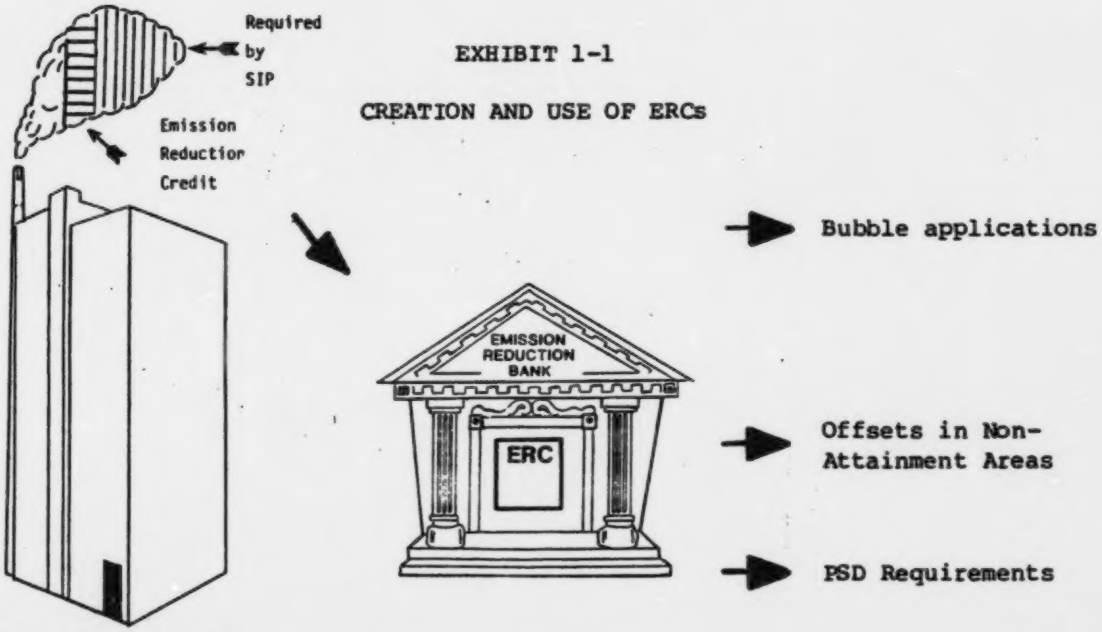
(1) under the bubble policy, which allows existing sources to reduce the costs of meeting current or future more stringent emission limitations;

(2) emission offsets in nonattainment areas which allow new or expanding sources to locate in areas that violate air quality standards;

(3) emission reductions by new or expanding firms to satisfy or to get exemption from permit requirements in prevention of significant deterioration (PSD) areas.

EXHIBIT 1-1

CREATION AND USE OF ERCs



1.2 THE ROLE OF BANKING

Bubble applications, offset cases, and PSD permits have occurred in the absence of a banking and trading program. For example, in the four years since the adoption of the offset policy, over 600 cases in which new or expanding firms have arranged for offsets have been documented. Similarly, over seventy bubble applications are now being processed by states and EPA with anticipated savings of over two million dollars per application.

SAVINGS THROUGH USE OF THE BUBBLE

The fact that significant cost differentials exist for reducing the costs of meeting pollution control requirements is vividly illustrated by several of the initial bubble applications submitted to state agencies and EPA:

Narragansett Electric Company: This bubble, which was approved in January, 1981, will save the company an anticipated $3 million in fuel costs annually. The application involves increases in sulfur emissions at one boiler as a result of burning higher sulfur oil and reduced emissions at a second unit either through the use of natural gas or by ceasing operations. In addition to significant cost savings, the bubble will result in a 30-50 percent decrease in sulfur emissions and will cut consumption of imported oil by 50,000 barrels per month.

3M Company: This pending bubble application involves the use of an innovative control technology to reduce hydrocarbon emissions on several tape coating lines in exchange for relaxed controls on other lines. 3M estimates a savings of $3 million in capital expenditures and $1-2 million in annual operating and maintenance costs.

Although the achievements of these programs to date have been significant, even greater cost saving opportunities exist. In almost all the offsets and bubbles cases, emission reductions were achieved within a single facility. Few cases have involved more than one plant, despite the fact that less expensive emission reduction from neighboring sources may have been possible.

There may also be situations as is typically the case with small firms or for new firms locating in an area) where internally generated emission reductions for either bubble applications or offsets are not feasible. These firms must seek other firms to take advantage of these programs.

In the absence of a banking system, arranging offsets or bubbles between two different industrial facilities not under common ownership is very difficult. Without a banking system, firms cannot receive advance credit for reducing emissions beyond legal requirements and therefore would not voluntarily do so. As a result, no ready supply of emission reductions has existed in the past and firms seeking emission reductions have had difficulty finding needed reductions from other firms.

Administrative delay and uncertainty are additional factors limiting the purchase and sale of emission reductions. A firm negotiating to purchase emission reductions from another firm needs some assurance as to the quantity and characteristics of the commodity it is purchasing. In the absence of a banking system which serves to quantify, verify and certify reductions, no such certainty exists.

1.3 THE ROLE OF PRIVATE TRADING

By December 1980 three areas had adopted comprehensive banking programs. Within the next 12 months approximately 20 additional states and localities will have comprehensive banking systems in operation. The spread of banking systems throughout the country provides the necessary foundation for increased activity by firms buying and selling emission reduction credits in order to reduce their costs of meeting control requirements. This manual focuses on private trading among individual firms, the most straightforward arrangement for bringing together firms interested in buying and selling ERCs.

The primary feature of private trading is that transactions occur through private negotiations without direct government involvement. Private trading characterizes the process by which most commodities (e.g., cars, houses, land) exchange ownership in our economy. But certain inefficiencies exist in private trading. For example, firms interested in purchasing offsets often will not have the knowledge of potential sellers or the expertise to evaluate offers, arrange financing, execute a contract, etc.

As with the sale of many other commodities, businesses have been formed that can earn a profit by assisting firms in arranging transactions. (See Exhibit 1-2.) Real estate brokers, stock brokers, and commodity dealers are just a few examples of situations where intermediaries serve an important function in making the market work. Environmental engineering firms have already functioned as brokers in several major offset cases. As banking and trading activity increases, brokers are likely to become an important feature of ERC trading.

THE BEGINNINGS OF A MARKET

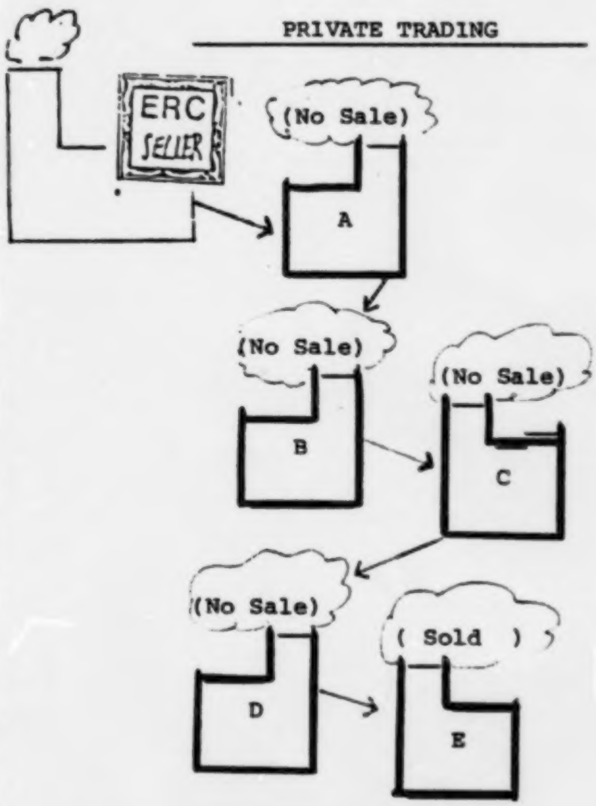
Will firms actively participate in buying and selling ERCs? At least initially, firms are likely to be reluctant because they are uncertain of the market price and of future availability. But during the past year, several promising signs have appeared that suggest a market for ERCs will develop:

- Several environmental engineering consultants have played an important role in locating offsets for new and expanding firms.
- New firms have recently been started to aid industry in ERC banking and use of the bubble policy.
- Several firms seeking to sell ERCs have placed advertisements in major business journals.

Each of these activities represent important steps toward creating a viable market for trading ERCs.

EXHIBIT 1-2

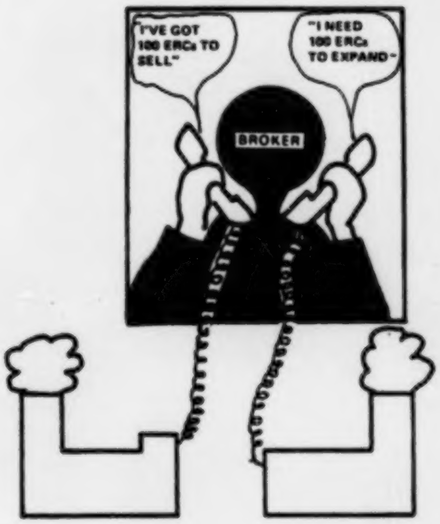
THE USE OF BROKERS CAN MAKE PRIVATE TRADING MORE EFFICIENT



PRIVATE TRADING

ERC SELLER
(No Sale)
A
(No Sale)
B
(No Sale)
C
(No Sale)
D
(Sold)
E

The ERC seller needs an effective way to seek out potential buyers.



PRIVATE TRADING WITH BROKER

"I'VE GOT 100 ERCs TO SELL"
"I NEED 100 ERCs TO EXPAND"
BROKER

A broker brings potential buyers and sellers together.

1.4 EVALUATING ALTERNATIVE TRADING SYSTEMS

Because private trading is the most direct means of bringing together firms seeking to buy and sell ERCs, it is the approach many communities are likely to adopt. There are, however, other ways to structure transactions involving the sale of ERCs. Two potentially attractive trading systems described in companion publications are:

- Public Auction System. The auction system uses a local organization to administer the entire auction process: accepting ERCs to be put up for sale, determining which firms are eligible to participate, conducting the auction, and recording the sales which occur. Public auctions are open and avoid problems that may arise when potential buyers are excluded from the opportunity to purchase ERCs. It is the most efficient means of bringing together groups of interested buyers and sellers of ERCs.

- Central Trading System. A single organization, called a central trading exchange, would be responsible for buying ERCs from producing firms and reselling them to user firms. The association would be charged with negotiating purchase prices, setting resale prices, and acquiring and maintaining an ERC inventory. The central trading system is particularly useful in protecting small businesses, in providing a stock of ERCs that are readily available to potential buyers, and in providing a ready market for firms creating ERCs. This system is expensive to start, and sales and purchase prices may be difficult to determine.

Because of the particular strengths and weaknesses of these systems, a community may want to structure a trading program which combines aspects of two or more of these prototypes. For example, in Puget Sound, firms creating ERCs have up to seven years to use or sell them through private negotiations, after which time they would be sold through a public auction.

1.5 THE ADVANTAGES AND DISADVANTAGES OF PRIVATE TRADING

In examining the desirability of relying primarily or exclusively on private trades, a community will want to carefully consider a number of factors. Likely advantages of private trading include:

Little public involvement or resources are required. A key advantage of private trading is the minimal amount of public financing needed to administer the program. Because firms finance their own trading activities, the public role is limited. To the extent that a public body gets involved to provide information and assistance, these functions will be neither time-consuming nor very expensive.

Brokers play a multi-functional role. In addition to bringing ERC producers and users together, brokers are likely to serve a number of other important purposes as well. Brokers can act as channels of information; for example, spreading the word about innovative abatement technologies among interested firms. Brokers also may provide technical and financial assistance to firms at all stages of the banking and trading process, from identifying possible ways of producing ERCs through the final sale of ERCs to another firm.

Gaps in coverage by brokers can be filled by a public agency. Although brokers can perform many services, the local public agency can fill gaps in this service by providing information clearinghouse activities. The clearinghouse function gives prospective buyers and sellers of ERCs a central location for obtaining information; this information can be used to supplement information from brokers or it can help trading parties decide if they need the services of a broker. The public agency also can selectively serve as a broker for proposed developments of particular interest to a community.

Limited Public Resources Can Be Effectively Used. By allowing private trades to encourage the production of inexpensive ERCs, scarce public resouces can be carefully targeted to achieve economic development goals. Local economic development agencies can participate in the private marketplace by buying or subsidizing the purchase of ERCs by firms selected by the community for economic assistance.

Likely disadvantages of private trading include:

Private trading is difficult to use to influence economic development. Because the public sector has very little involvement in or control over the private trading of ERCs, it will be difficult to control trades to effect desired economic development objectives. Under a central trading system, for example, the central trading exchange can use the purchase and resale of ERCs as a way of directing economic development. If it wants to encourage growth, the sale price of ERCs can be set low; if additional ERCs are needed to expand the industrial base, the purchase price for ERCs can be raised. Private trading is far more limited in its ability to achieve these objectives.

Private trading limits the access of potential buyers to available ERCs. By definition, private trading does not ensure the same degree of free and open access to the system as does either of the other trading system options. Even where brokers are used to arrange transactions, all interested buyers do not have an equal chance of buying a particular ERC. Trades are arranged selectively rather than publicly.

In addition, private trading may not result in public prices because transaction information is known only to the parties involved (buyer, seller and broker). This failure to disseminate price information may interfere with the efficient functioning of the market. Potential buyers and sellers will not have any information about past sales prices and therefore will have no basis for their own decisions. It is possible, however, to require price disclosure as part of a formal banking and trading system.

Firms may try to use their ERCs for anti-competitive objectives by refusing to sell them to competitors, or by cornering the local market on ERCs to prevent competitors from moving in. Although private trading does not directly prevent this type of behavior, antitrust restrictions would apply to deter such actions.

The costs of bringing buyers and sellers together may be higher with private trading than with the other two trading mechanisms. The absolute cost of making trades may be quite high for buyers and sellers. The producer and purchaser must find each other, either on their own or through a broker, and time consuming negotiations are likely. Moreover, the agreed-upon sale price must also cover the broker's commission, raising the cost of the transaction. An auction or central trading system would involve lower costs of bringing together firms interested in buying and selling ERCs.

A community considering private trading as the sole or primary trading mechanism should weigh carefully all these advantages and disadvantages in the context of its particular local conditions and economic development objectives.

1.6 SCOPE OF THIS MANUAL

Because of the demand for emission reduction credits for use as offsets by new or expanding firms and for use in bubbles to reduce control costs for existing firms, some private trading is likely to occur once a banking system is adopted by an area. But trading activity, at least during the initial months following adoption of a banking program, will probably be limited. Some firms may be reluctant to sell their ERCs, fearing that few will be available for purchase in the upcoming years. Many more firms will be unaware of the possible profits from conducting an "emission reduction audit" of their facilities to establish the costs of creating bankable reductions. Until a number of trades have occurred, the absence of any clear price signals may deter activity by potential buying and selling firms. Finally, the costs of bringing together interested firms may initially be high.

This manual explores a number of constructive actions to overcome these potential difficulties. Chapter 2 examines the role of "brokers" in assisting firms interested in buying and selling ERCs. Chapter 3 discusses possible activities for public agencies, particularly air pollution control agencies, economic development, and planning organizations that want to pursue a trading program as part of a comprehensive program to achieve the full economic and air quality benefits of controlled trading.

2. THE ROLE OF BROKERS IN TRADING ERCs

Brokers play an essential role in many markets, although the types and extent of services provided as well as the functions performed may vary considerably. For example, stock brokers provide investment counsel as well as stock transfer services. On the other hand, most real estate brokers perform more limited counseling functions; their primary role is to bring buyers and sellers together. The kind of market involved will determine both the need for and the opportunities available to brokers. The particular services and functions provided by ERC brokers, described in Section 2.2, are likely to be qualitatively different from those performed by other brokers, largely because of the more technical nature of the market.

In addition to performing the obvious role of bringing buyers and sellers together, ERC brokers may also provide technical assistance on pollution control options, permit changes, and other regulatory requirements. This Chapter discusses the possible roles of brokers in ERC trading including:

- who is likely to act as an ERC broker;
- the possible functions brokers could perform in trading ERCs;
- the legal status of brokers as agents and fiduciaries;[1]
- the ways in which ERC brokers may be compensated for their services; and
- the possibility of brokers taking on the additional role of buying and selling ERCs themselves.

2.1 WHO MIGHT BECOME A BROKER

The use of brokers to trade ERCs is a specialized application of the more general activity known as brokerage. Brokerage involves the bringing together of parties interested in making a transaction. If the subject is a real estate transaction, a real estate broker is generally used; "media brokers" are used to arrange the sale of radio and TV stations, including the transfer of broadcast licenses; stock brokers arrange transactions in registered securities. In each instance, the broker acts as an agent on behalf of a principal (either the buyer or the seller) and is paid a commission which is usually a percentage of the amount involved in the transaction. Historically, brokers have played important roles in fostering economic and social development of all kinds by helping to make markets work.

---

[1] A "fiduciary" is someone entrusted with the responsibility to act on behalf of one party with respect to other parties involved in a business situation (e.g., a trustee).

A number of individuals and organizations might have the skills and interests necessary for providing services to interested firms. The following groups are likely to have the qualifications which would enable them to act as private ERC brokers:

- consulting engineers;
- industrial real estate brokers;
- industrial locators and developers;
- vendors of pollution control equipment;
- pollution control engineers;
- venture capital firms and financiers; and
- other professionals who specialize in environmental and air pollution issues.

The skills and qualifications necessary for ERC brokering reflect the functions that brokers are likely to be asked to perform. In addition to the general financial and pollution control knowledge needed by most brokers, ERC brokers will need to be familiar with various aspects of industrial development, permit requirements and administrative procedures, state and local rules for banking and trading, and tax and financing matters. The specific combination of skills will depend on the particular services a broker chooses to provide.

2.2 FUNCTIONS PERFORMED BY BROKERS

Generally speaking, the primary function performed by ERC brokers will be to bring together a buyer and a seller. ERC brokers may also perform other functions, however, including:

- appraising the market value of a potential ERC and the costs of producing it;
- providing assistance in securing financing for producing or purchasing a surplus emission reduction;
- counseling potential ERC buyers and sellers about market facts and trends;
- arranging other services such as engineering analysis and performance bonding where necessary;
- providing assistance in preparing appropriate paperwork and securing necessary permits; and
- supplying legal advice (only in the case of licensed attorneys) or accounting services for tax planning.

In addition to facilitating trades of existing ERCs, brokers also may take a major role in assisting firms who would like to produce ERCs for trading (or banking) purposes. This responsibility would be especially appropriate for brokers with training or experience in pollution abatement strategies enabling them to identify possible sources of ERCs. While such a service is not typically associated with brokerage duties, it is clearly one which ERC brokers may find desirable to offer.

Exhibit 2-1 depicts the possible roles for ERC brokers in each of the six key phases of the banking and trading process: identification and creation of potential emission reductions; confirmation and quantification of the emission reduction; certification of the ERC; banking the ERC; trading of the ERCs; and using of the acquired ERC.

1. Brokers can play a pivotal role with respect to the identification and creation of emission reductions. This role could involve:

- locating sources with the potential for creating low cost emission reductions (e.g., conducting an emission reduction audit);
- evaluating alternative control techniques in terms of their engineering feasibility;
- assessing capital and operating costs of alternative emission reduction techniques, including process or input changes, revamping product lines, etc;
- appraising the potential market value of a proposed emission reduction; and
- arranging the financing necessary to create the reduction.

CONDUCTING AN EMISSION REDUCTION AUDIT

In the absence of a banking and trading system, firms have little reason to examine their production facilities to determine the possibilities and costs of creating bankable emission reductions. Once a banking system is developed which allows them to receive credit for these reductions, firms will want to assess their potential for creating reduction. Plant managers may be instructed to review control strategies to determine the cost at each point source of more stringent controls. These emission reduction audits will provide useful information to plant managers and financial planners in evaluating whether it is less expensive to meet control requirements through the use of a bubble and whether any needed offsets should be created internally or purchased on the open market. Through these audits, firms will also be better able to determine whether they can sell ERCs that they produce and earn a significant return on investments in pollution control.

EXHIBIT 2-1

ROLES FOR BROKERS IN ERC BANKING AND TRADING

	Banking and Trading Process	Potential Broker Services
1.	Creation of Emission Reduction	• Locating eligible sources • Evaluating engineering feasibility • Studying economic feasibility of various control strategies • Appraising market value of reductions • Arranging financing
2.	Confirmation of Emission Reduction	• Documenting emission reductions • Performing engineering analyses • Preparing application and technical documents • Monitoring • Verifying performance
3.	Certification of Emission Reduction Credit	• Preparing required application • Verifying eligibility • Documenting application
4.	Banking	• Conducting market value appraisals • Evaluating proposed uses
5.	Trading	• Locating trading partners • Arranging financing • Evaluating potential trades • Providing tax planning and legal advice
6.	Use of Credit	• Evaluating potential uses • Submitting permit application • Performing engineering analysis • Obtaining financing

All of these services could be provided by private brokers on behalf of either buyers or sellers of ERCs. A broker retained by a buyer to locate ERCs could act as an agent in identifying potential ERC producers. Alternatively, a broker might be retained by a firm desiring to create and sell ERCs for the most advantageous price. Here, the broker could assist in identifying the most economically attractive and technically feasible emission reductions, and in transforming these reductions into ERCs through the official confirmation and certification process.

To perform these functions, ERC brokers will need a fairly detailed understanding of air pollution control technology and the likely cost of different control strategies. Brokers experienced as consulting engineers might be retained to work with the plant manager to identify innovative control strategies. By performing this service, brokers will in effect also hasten the dispersion of an innovative control technology.

II. The confirmation of emission reductions requires official verification of the quantity and permanence of the emission reduction created. Brokers could assist sources in preparing the appropriate technical documentation required for permit and banking applications. Depending on the type of transaction this might involve monitoring analysis of production or input data, stack tests, etc. In most instances it will be necessary to provide documentation for emissions levels both before and after the emission reduction occurs.

III. The certification of emission reductions and their conversion into ERCs is the third phase of a banking and trading program. Brokers are likely to be involved in preparing the required applications and technical support documents required by the air pollution control agency.

IV. The fourth stage--banking the ERCs--requires little action on the part of sources. In general, sources with banked ERCs need to do nothing to retain that status. However, these sources might hire brokers or consultants to appraise the current market value of banked ERCs and the desirability of trading at a particular point in time. This sort of appraisal can assist sources in deciding whether and when to trade.

V. Brokers are likely to play a major role in the fifth stage--the actual trading of ERCs. Whether retained by a firm needing to buy or one wishing to sell, a broker can perform the important service of finding another party to consummate the transaction. Brokers can inform firms of potential bubble opportunities. In addition, a broker might perform other valuable services in connection with the trading of ERCs. For example, brokers can help to arrange financing for a particular transaction as well as tax planning assistance and general legal advice in consummating a trade. Brokers will also be involved in working with the air agency to determine the quantity of ERCs at a particular location needed as offsets, or to bubble.

VI. Brokers also may participate in the final stage of a banking and trading program--the use of ERCs to satisfy a permit or SIP requirement. Based on guidelines published by the local APCA, a source may propose a use for a particular lot of ERCs. To help the local authority make a determination on the proposed use, sources must provide documentation demonstrating that (1) the pollutant characteristics of the ERCs and the proposed use are compatible (i.e., same pollutant type and acceptable impact on ambient air quality) and (2) the use is compatible with the SIP. The preparation of this documentation and associated engineering analyses is likely to furnished by brokers as a technical service.

Summary

The functions performed by ERC brokers are likely to be more diverse than those conventionally associated with the broker's role. Rather than limiting their involvement to the actual search for and negotiation of transactions, ERC brokers may become involved in a wide range of activities in all phases of the banking and trading process.

2.3 LEGAL STATUS AND DUTIES OF BROKERS

As do brokers of any good or commodity, ERC brokers have a unique legal relationship with buyers and sellers who use their services. The role of a broker as an agent of a principal (a buyer or seller) is a fiduciary relationship which is subject to the requirements of the law of agency. Under this law, an ERC broker is free to accept or reject contract relationships with potential principals. However, once a contract has been established, the broker is required to meet the same high standard of conduct as the law imposes upon attorneys, administrators and executors, guardians, bankers, public officials, and other persons vested with fiduciary obligations.

As an agent, an ERC broker owes the principal certain clear and specific legal duties arising out of the fiduciary relationship: care and skill, obedience, accounting, loyalty, and notice. These duties can be briefly summarized:

- Care and Skill: An ERC broker must exercise a reasonable degree of care and skill in transacting business on behalf of the principal. The broker is legally liable for any losses resulting from his or her carelessness or negligence in arranging ERC transfers, creation, and use.

- Obedience: An ERC broker must act in good faith and in conformity with the principal's instructions and authority. The broker is legally liable for any losses incurred by the principal which result from any act which is outside the scope of authority granted.

- Accounting: An ERC broker must be able to report accurately the status of any funds entrusted by the principal. In many states, fiduciaries are required by law to deposit funds in special accounts (trust or escrow) and are prohibited under penalty of law from mixing this money with personal funds.

- Loyalty: An ERC broker must always place the principal's interest above those of other persons with whom the broker is dealing. Information about the principal's financial condition, bargaining posture, or any other confidential facts that might harm the principal's bargaining position must not be disclosed.

- Notice: An ERC broker must keep the principal fully informed at all times of all facts or information which could affect the principal's business or purchase decisions. The broker must also disclose any and all personal interests in a transaction. In certain instances, a broker may be held legally liable for losses resulting from failure to disclose such information.

There is an additional legal constraint on the way brokers must exercise their responsibilities. In carrying out required duties, brokers must be careful to ensure that no statements can in any way be interpreted as involving fraud. (Fraud refers to all deceitful or dishonest practices intended to harm or take advantage of another person, including the concealment or nondisclosure of important facts.) If any party suffers a loss because of a broker's misrepresentations, the broker can be held liable for damages.

Aside from these basic duties, few, if any, additional legal constraints or requirements need be placed on the activities of ERC brokers. The nature of other markets often necessitates additional control or oversight mechanisms--licensing, bonding, professional affiliation--to help protect the general public from dishonest or deceptive brokers. The complexity and sophistication of the ERC market is likely to ensure against this problem, however, because unqualified individuals would have a difficult time presenting themselves as skilled and experienced in ERC transactions. Moreover, the individual firms involved in ERC trades are likely to be quite sophisticated as well, and therefore would be unlikely to engage a broker whose skills had not been carefully studied and confirmed. In this sense, neither buyers nor producers of ERCs can be considered members of the "general public" needing safeguards against abuse at the hands of dishonest brokers. If this problem is anticipated, however, or if after a time it develops, rules requiring licensing or bonding could be adopted as part of the banking and trading system.

2.4 THE ERC BROKER AS AGENT

The legal status of an ERC broker, according to the law of agency, is that of a "special agent" authorized to represent the principal in one specific transaction or piece of business. As a special agent, a broker may be retained by a seller to find a ready, willing, and able buyer, or by a buyer to find a ready, willing, and able seller of ERCs. As a special agent, the broker is not authorized to bind the principal to any contract or to consummate a sales deal.[2]

---

[2] In contrast, a "general agent" may sign contracts on behalf of a principal and may thus bind the principal to obligations within the scope of the agent's authority. A "general agent" must be specifically authorized to represent the principal generally or in all matters concerning one aspect of the principal's interest.

A broker may be an agent either of a buyer or a seller of ERCs. The general rule of law is that an agent cannot be "loyal" to different principals with different interests in the same transaction. Most courts will allow a broker to receive compensation from both the buyer and seller in a transaction if there has been prior, mutual knowledge and consent of all the parties, although some state courts have rejected this "informed consent" exception.

An agency relationship is created by agreement of the parties. When a broker is retained to represent a seller, a contract will be prepared which describes the property to be sold, the broker's duties, and the compensation for successful performance. Similarly, when a broker is retained to represent a buyer, an employment contract between the broker and the seller may be prepared. These contracts do not guarantee that the broker will be able to find a buyer or seller, but do obligate the broker to use reasonable effort to carry out successfully the assumed agency duties. Contracts also bind principals to provide compensation to brokers in the manner spelled out in the agreement.

2.5 COMPENSATION FOR BROKERS

The broker's monetary compensation is usually specified in the agreement made with the firm engaging his or her service. Compensation often takes the form of a "commission" or brokerage fee computed as a percentage of the total amount of money involved in the final transaction, though a flat fee or hourly rate may be negotiated instead. Most sales commissions are payable when the sale is consummated.

The economic rationale for using and compensating brokers reflects their ability to reduce the costs of transacting a trade for their principals. To work efficiently, markets depend on accurate information and informed traders; brokers are a source of market information as well as a resource for locating trading partners. Principals who choose to use brokers rather than to rely on their own efforts at direct negotiation have obviously made a judgment that the cost of the broker's commission is less than the cost of transacting the trade without a broker. Where transaction costs are relatively high in the absence of broker involvement, there is a potential role for brokers to reduce the costs of a trade while earning a commission for themselves.

Costs specific to the trading of ERCs include the cost of finding a ready, willing, and able buyer or seller and the cost of applying for a transfer of credits and preparing the necessary documentation. Clearly, the complexity of the process and the difficulty of bringing together buyers and sellers of ERCs indicates that transaction costs are sufficiently high to compensate brokers for their services.

2.6 DEALERS AND BROKER-DEALERS

Special consideration needs to be given to dealers and "broker-dealers" concerning their participation in ERC trading. In contrast to a broker who effects business transactions for others, a dealer is someone who buys and sells on his or her own account. A broker-dealer is someone who is both a broker and a dealer. Broker-dealers are common in the markets for securities and commodities, but less common in the real estate business.

In an ERC market, a "dealer" would both buy ERCs for resale and sell ERCs out of a purchased (or financed) inventory. Such purchases and sales would be credited to the dealer's own account; the dealer would not be acting as an agent for the buyer or seller. The dealer receives no brokerage commission but relies upon a favorable difference between the prices at which the ERCs are bought and sold (i.e., the "mark-up") for compensation. Any risk of loss thus falls entirely upon the dealer.

As noted earlier, the law is designed to prevent agents from acquiring any independent interest which might tempt them to act against the best interests of their employers. However, considerable latitude exists for the exercise of the functions of broker and dealer by the same person, provided "complete disclosure" is made.

For example, if employed to sell ERCs, a broker-dealer may not, without complete disclosure to the customer, purchase them for his or her personal account. Similarly, if authorized to purchase ERCs, the broker-dealer may not supply them from a personal account without disclosure of this fact. A purchase or sales transaction made without the required disclosure may be cancelled at the will of the customer even though no actual damage was sustained and the broker-dealer perpetrated no actual fraud.

BUYING ERC OPTIONS

Transactions involving options have become an established way of doing business for a number of commodities similar to ERCs. Firms buy options on land when they are uncertain about future expansion plans and want to minimize their front end capital expenditures. Precious metals, grains, and many other commodities are traded through the purchase and sale of options.

Why would firms and brokers want to get involved with ERC options?

Options offer several important advantages to ERC traders. Most important, by buying an option for ERCs, firms can insure their availability without incurring the significant capital costs often necessary to install additional pollution control equipment. In addition, just as options are critical to firms assembling large parcels of land, firms might purchase ERC options as they negotiate large offset transactions.

Summary

Although the expertise needed of ERC brokers and the tasks they will perform are likely to be quite diverse, there appear to be several types of organizations and individuals which easily could carry out some or all of the functions likely to be needed or requested. In this sense, there already exists a qualified pool of potential brokers which could easily meet the demands of a new trading program, and in fact, several major offset transactions have involved the services of a broker. Brokerage functions offer an attractive opportunity for engineering firms, industrial location firms, environmental consultants and related professionals to extend their current activities into a potentially profitable new area.

3. THE ROLE OF A PUBLIC AGENCY IN PRIVATE TRADING

Private trading of ERCs between individual firms is attractive because it requires minimal attention or resources from the public sector. The little public agency involvement that does occur can, however, enhance the effectiveness of the private trading system by performing some relatively simple and inexpensive administrative tasks, and by filling gaps in service that might otherwise exist. The public agency's role can make the difference between a private trading program that serves a community well and one which is less able to meet the community's best interests.

The public agency's role encompasses five specific activities:

(1) providing an information clearinghouse;

(2) providing guidance about contracts with brokers;

(3) establishing a price disclosure mechanism;

(4) acting as a broker (optional); and

(5) coordinating with other programs.

In general, these activities provide participants in the trading system with information and assistance that are not necessarily available otherwise. Activities in support of the trading program could be performed by the air pollution control agency but, because they are more directly linked to economic assistance, they will generally fall within the domain of economic development agencies or planning organizations. (See Exhibit 3-1)

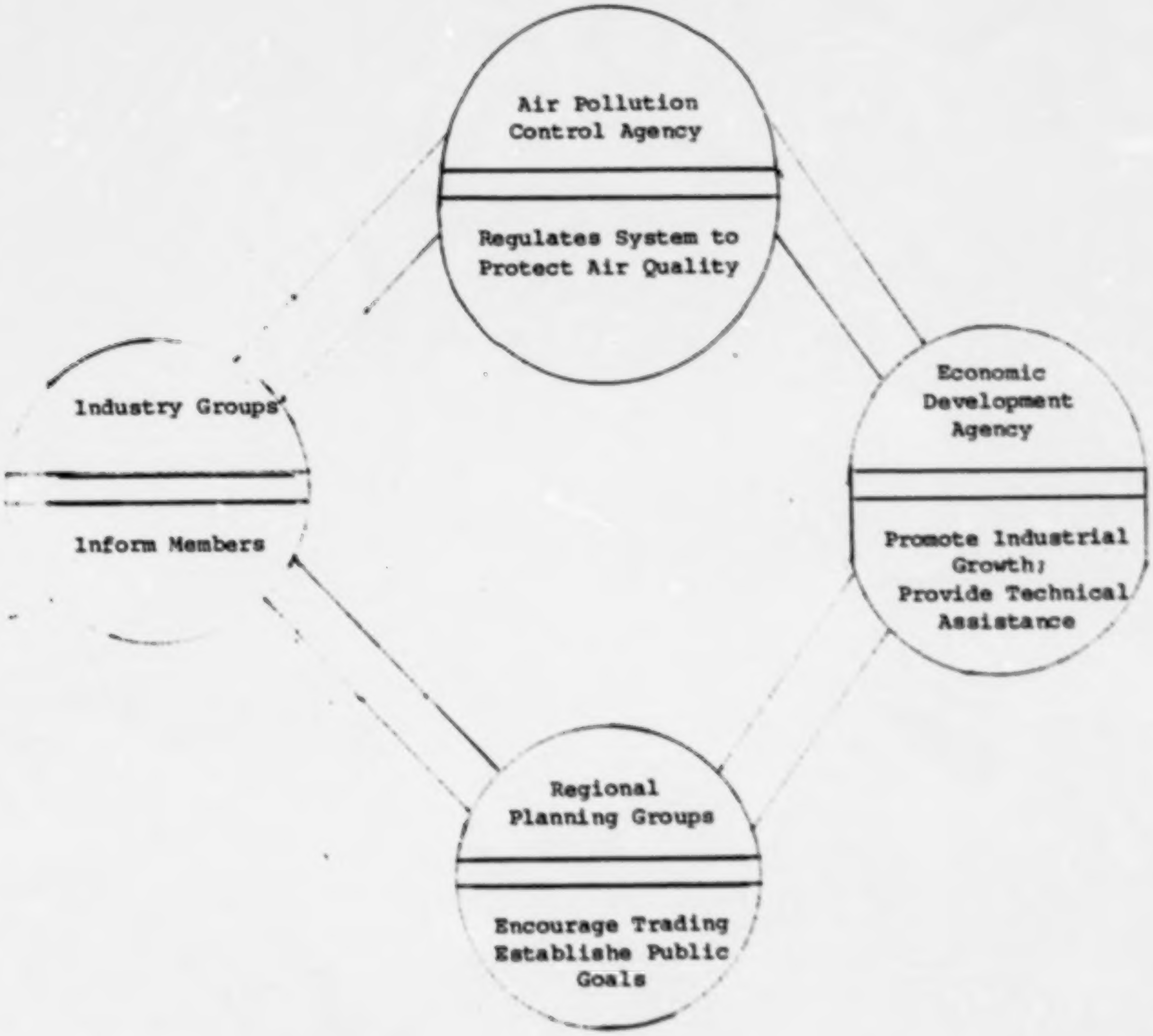
3.1 PROVIDING AN INFORMATION CLEARINGHOUSE

One concern of a trading program limited to private transactions is that parties will not have enough information to make the best possible trade. This lack of information could result in behavior (e.g. unawareness of less expensive ERCs, failure to bargain with all possible buyers or sellers) that limits the effectiveness of ERC trading and thereby unintentionally limits a community's economic growth. One of the most useful functions that can be performed by a public agency (e.g., Council of Governments, Economic Development Agency, Regional Planning Association, etc.) is to supply the information needed to improve ERC trading activities. Four general kinds of information can be provided to parties engaged in ERC trading.

o List of brokers: The public agency can maintain a directory of brokers who are active in the ERC market. This directory will have updated information about how to contact brokers, whether they specialize in providing certain kinds of services, how long they have been brokering ERCs, a list of past clients, and other relevant information.

EXHIBIT 3-1

DEVELOPING AN INTEGRATED BANKING AND TRADING PROGRAM


Air Pollution Control Agency
Regulates System to Protect Air Quality
Industry Groups
Inform Members
Economic Development Agency
Promote Industrial Growth; Provide Technical Assistance
Regional Planning Groups
Encourage Trading Establishe Public Goals

- List of potential ERC sellers: The public agency may periodically publicize the names of sources holding ERCs in the bank or undertake a study or survey to identify likely sources for producing ERCs. These lists would be a valuable resource to firms seeking to locate in the community, or seeking to bubble as a means of compliance.

- Financing information: The public agency may also provide information or assistance to firms concerning the possible ways of financing the creation or purchase of ERCs. A manual could be prepared to highlight possible financing mechanisms, their applicability, and any application procedures. This material should include information concerning federal, state and local government programs as well as private avenues of funding.

- Necessary permit changes: ERC certification procedures, and other regulatory requirements fall within the purview of the APCA or other air quality regulatory organization. Potential ERC traders should be directed to that agency for information about procedural and other requirements for using ERCs to satisfy regulatory requirements.

The information clearinghouse role supplies a missing dimension to private trading and helps make it more effective. Private trading can be further enhanced if guidance is provided concerning the nature of agreements made between brokers and ERC buyers and sellers. A discussion of this issue follows.

3.2 PROVIDING GUIDANCE ABOUT BROKERAGE AGREEMENTS

One very important decision that will be faced by producers or sellers deciding to work through an ERC broker is how to structure the brokerage agreement. It is likely, at least during the initial stages of the program, that the possible forms which a broker-principal agreement can take may not be known or fully understood by many producers or sellers of ERCs. One key function which the public agency can perform is to provide guidance on the various contractual options, pointing out their relative advantages and disadvantages.

In general, ERC buyers are likely to negotiate an agreement whereby they pay the broker much as they would a consultant--either a cost-plus-fee arrangement or a percentage of the value of the transaction. These agreements are not very complicated to arrange and are of the type that most firms seeking ERCs will have used frequently in other contexts.

The agreements available to the ERC producer are more complicated and may be less familiar to such firms. A broker's inventory consists of ERC "listings" obtained from prospective ERC sellers. A "listing agreement" constitutes the contract of employment between the ERC seller (principal) and broker (agent). Thus, when the broker has been retained by the seller, the ERC listing agreement spells out the rights and duties of each party. Several different kinds of listing agreements or employment contracts are commonly used. Each has different implications for trading ERCs. The public agency can inform potential ERC sellers about these listing agreements and about the implications of each kind of listing. The most common listing arrangements are described below, and their consequences for ERC trading are noted.

- Open Listing: The seller retains the right to employ any number of ERC brokers to act as agents simultaneously. The seller is obligated to pay a commission only to that broker who successfully produces a ready, willing, and able ERC buyer. This contract option can, but does not necessarily, achieve wide exposure of ERCs to firms needing them. Under this option, attempts to sell ERCs are limited only by the seller's own efforts in arranging for brokers to handle offered ERCs.

- Exclusive Agency Listing: Only one broker is authorized to act as the agent for sale of the ERC. The ERC owner retains the right to sell the ERCs without obligation to the broker, unless the broker was responsible for the sale. Efforts to sell ERCs are limited to the actions of one broker and any private initiatives by the selling firm.

- Exclusive Right to Sell. Only one ERC broker is appointed as agent with the exclusive right to sell the ERCs in question. The seller gives up the right to sell the ERCs and must pay the broker a commission, regardless of who actually sells the ERCs. From the broker's standpoint, this is the preferred contract option--the broker is assured of a commission if the ERC changes hands. This type of listing, however, limits sellers by requiring them to give up for a time the right to sell its ERCs or to hire another broker.

- Net Listing. The broker agrees to pay the ERC seller the net listing amount, and the broker is free to offer the ERCs for sale at any higher price. The difference between the net listing amount and the sales price is retained by the ERC broker as a commission. This option creates a conflict between the interests of the broker and the seller; with the more usual percentage commission, a higher selling price benefits both the broker and the seller. But under a net listing, a higher price benefits only the broker (and of course lessens the likelihood of any sale).

Except for net listings, which are illegal in some states, all of the above types of brokerage employment contracts can be used. A contract will generally create an open listing unless specifically provided otherwise in the agreement.

3.3 ESTABLISHING A PRICE DISCLOSURE MECHANISM

Prices paid for ERCs traded privately may not be publicly-available because (1) private trading does not take place in public, and (2) private contracts may be drafted in a manner that obscures the price paid for ERCs even if the contracts are made public. The lack of publicly available prices is a major disadvantage because public prices act as an important signal for potential buyers and sellers. Without knowledge of the prices from past transactions, firms interested in buying and selling ERCs will lack the necessary information to make a rational decision. It is possible, however, to overcome this disadvantage by incorporating two alternative requirements as part of the banking rule:

(1) an ERC transfer application, or

(2) a standard form of sales contract.

Either of these devices will accomplish the objective of public prices; there should be no need to require both. Before either of these two price disclosure strategies can be used, however, a basic question must be resolved: Can price disclosure legally be required?

The legality of requiring price disclosure. Unlike the auction and centralized systems for trading ERCs, private trading does not directly result in publication of sales prices. It will be necessary, therefore, for price disclosure to be required by administrative rule. The rule should be part of the banking system and require that price disclosure be made before ownership of the ERCs is formally transferred on the banking registry. (Price disclosure is required in other areas. For example, the prices paid for houses are available to the public.) Only in cases where parties demonstrate that price disclosure would reveal confidential business information would an exception from this requirement be reasonable.

ERC Transfer Application. The most straightforward means of getting needed price information is to ask for it. The banking authority or any properly designated public agency can require the disclosure of sales information as a condition of transferring ERCs on the banking registry. The trading firms can be required to disclose the sales price and to supply a copy of the transfer contract or sales agreement at the time the transfer is recorded. In this way, price information would be public.

The disclosure requirement should cover all cash and non-cash (e.g., stock) compensation or benefit received by the seller as a result of the trade. It still may be possible, however, for transfer agreements to be drafted in such a way that the price paid for ERCs is obscured. The use of special forms for sales contracts should be considered as a means of eliminating this problem.

Standard Forms of Sales Contracts. Most businesses are interested in protecting certain confidential financial and commercial information. If a firm involved in an ERC transfer is concerned about making public certain details of the transaction, the sales contract may be written so as to obscure the actual price paid for the ERCs. As a result, the public agency might find it difficult to determine the exact sales price in a given trade. The required use of a special form for sales contracts would alleviate this situation.

A form for transfer of ERCs can be drafted by the public agency for use by prospective traders. Many local real estate boards, for example, commonly prescribe form contracts for real estate sales. The form could be simple and straightforward, including:

- details of the transaction;
- value of the compensation received for the ERCs; and
- any protection provisions negotiated.

Details of the transaction might include a description of the ERCs purchased. The value of the transaction should include monetary as well as other forms of compensation. Protection provisions specified by the contact may include indemnification provisions, insurance requirements, or equipment performance bonding (in the case where the ERC purchaser installs pollution control equipment in a facility operated by the producer of the ERCs). In addition to providing a valuable source of market information for future participants in ERC trading, such a standardized contract form would ensure the consistency and clarity of the formal record of ERC transactions.

3.4 ACTING AS A BROKER

In the past, public agencies have in several cases taken an active role in arranging offsets for firms seeking to locate in their communities. For example, in Pennsylvania, the State Department of Environmental Resources arranged for the creation (by the State Transportation Agency) and provision of offsets to Volkswagen, enabling that firm to construct and operate a plant in western Pennsylvania. There are two brokering functions that public agencies are likely to perform:

- assisting private firms in identifying and financing opportunities to create ERCs;
- subsidizing the purchase of ERCs as a means of inducing firms to locate or expand in a community.

In both of these situations, the public agency may find it desirable to directly influence the private trading process by performing the services of a broker.

Although brokerage activities would significantly increase the role of the public agency, such activity is not unprecedented. Economic Development Agencies (EDAs) have always been actively involved in trying to attract new industry to a community. The EDA promotes the economic well-being of a community by, among other things, arranging land, zoning, transportation, and in this instance the offsets necessary to locate in a community.

Most public agencies would prefer having direct control over a supply of ERCs to use to attract industry into an area, but this generally will not be feasible. One likely source, surplus emission reductions at municipal facilities, will generally be limited in number and expensive to produce. Although it may be possible to confiscate a portion of ERCs created by shutdowns or to place a tax on the creation of all ERCs, such a policy is likely to have the unwanted effect of reducing banking and trading activity and should be adopted only after careful consideration of its legality and desirability.

The same objective, providing ERCs to industry as a way to encourage economic development, can be accomplished indirectly through a thriving ERC market in which offsets are readily available for private purchase or through the use of public funds to purchase ERCs from the marketplace for donation to incoming firms. Public funds may be available for this purpose through the use of industrial development bonds and state and federal economic assistance programs.

3.5 COORDINATING WITH OTHER PROGRAMS

The public agency can coordinate private trading activities with other relevant programs in the community. Two areas that must be closely integrated are the trading and the banking programs, as illustrated in Exhibit 3-2.

Coordination with the Banking Program

The public agency can help trading parties coordinate with the banking authority regarding requirements that must be satisfied before the formal transfer of ERCs on the banking registry can be made. Because the use of ERCs to satisfy emission limits will be an important part of most trades (i.e., purchasing ERCs to use in a bubble or to satisfy new source offset requirements), the APCA must be involved in reviewing the proposed transaction. It is essential that the public agency not make representations about the use of ERCs without prior consultation with the APCA.

As the first step, the parties submit either the required transfer contract[3] or an equivalent application to the banking authority. The banking authority must officially transfer ownership rights by cancelling ERCs, re-registering the affected ERCs and/or re-issuing new ERC certificates. After this has been done, the public agency may publish or make available to the public the sales price for the ERCs traded and other relevant details based on the disclosure rules which have been adopted. Finally, if the buyer decides to use the purchased ERCs, it is up to the APCA to approve their use. If the ERCs are used to satisfy emissions requirements, the bank will debit the user's ERC account accordingly.

Coordination with Other Trading Mechanisms

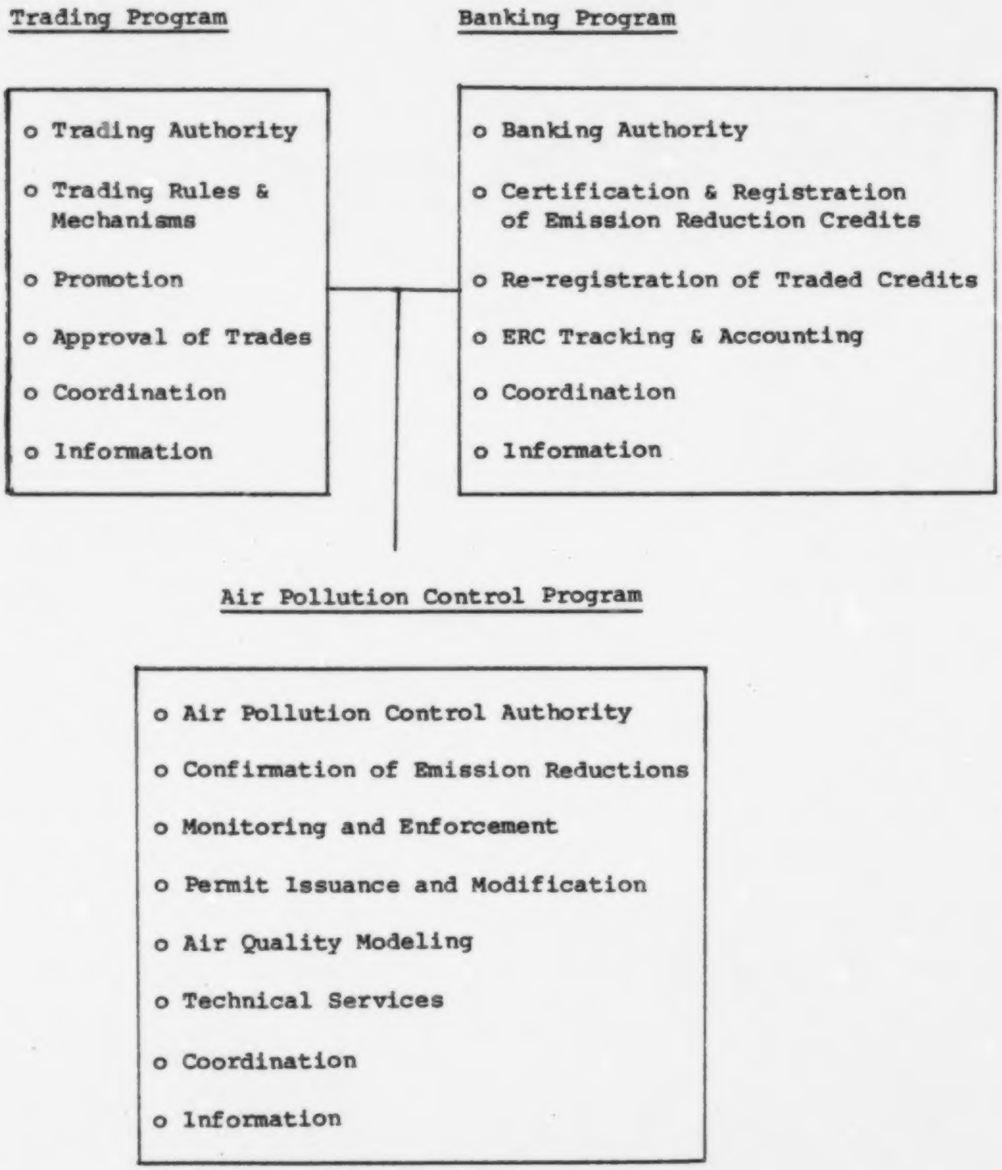
A community may use a trading system that includes both private and public sales as described in Chapter 1. If so, the private approach will be used only in some trading situations, and coordination should be maintained with other kinds of trading activities. Potential producers and users of ERCs should be kept informed of trading possibilities outside the private sphere. For example, if an out-of-state firm contacts a public agency about ERCs for a

---

[3] The transfer contract and special form should expressly state that the contract is "contingent" on official approval by the banking authority.

EXHIBIT 3-2

PROGRAM ELEMENTS AND INTERRELATIONSHIPS



Trading Program

- Trading Authority
- Trading Rules & Mechanisms
- Promotion
- Approval of Trades
- Coordination
- Information

Banking Program

- Banking Authority
- Certification & Registration of Emission Reduction Credits
- Re-registration of Traded Credits
- ERC Tracking & Accounting
- Coordination
- Information

Air Pollution Control Program

- Air Pollution Control Authority
- Confirmation of Emission Reductions
- Monitoring and Enforcement
- Permit Issuance and Modification
- Air Quality Modeling
- Technical Services
- Coordination
- Information

particular pollutant, it should be able to provide the firm with information about possible sources of the needed ERCs including the existence of brokers and any public trading avenues.

Another aspect of the coordination should involve joint publicity and promotional efforts. The availability of ERCs and the operating of banking and trading should be publicized in a uniform fashion. The promotional activities of the banking authority, other trading organizations, individual brokers, and other local organizations (e.g., EDA, Chamber of Commerce) can be combined to form a comprehensive presentation of the ERC trading activity and support available within the community.

Although many of the functions performed by the public agency are designed to facilitate private trading using brokers, the information and guidance will also be of use to ERC producers and buyers who choose not to use a broker's services. The services performed by the public agency can provide participants in private trading with assistance which would not otherwise be available. In so doing, the effectiveness of the private trading option is enhanced without requiring a large commitment of public resources. Once the services to be provided by the public agency have been identified and the necessary information assembled, only minimal administrative activity will be needed, as Section 4 describes.

4. ADMINISTERING PRIVATE TRADING

This section summarizes the administrative support required for the ongoing activities of the public agency involved in promoting trading activities. Although the public agency has fewer responsibilities under the private trading system than it would in either the auction or central trading systems, it could perform at least five important functions:

(1) to serve as an information clearinghouse;

(2) to provide guidance on agreements with brokers;

(3) to disclose price information;

(4) to serve as a broker; and

(5) to coordinate with other relevant programs.

These functions were discussed in Section 3. The administrative support needed for these five responsibilities encompasses personnel, financing, and publicity. This Chapter describes each of these issues.

4.1 STAFFING

A trading program based on private brokers should require little staff time from the agency which has assumed trading responsibilities. Staffing responsibilities are primarily to provide information and to coordinate trading activities with other relevant programs and offices. A very limited staff probably will be adequate to meet these responsibilities. A program director will be required, although this position is very unlikely to be full-time. In addition to the director, it is likely that only one other full- or part-time staff member will be needed to perform the information clearinghouse functions (maintaining the lists of available ERCs, potential buyers, and interested brokers) and the general administrative and clerical duties. If the agency opts to serve as a broker of ERCs, additional staff may be required.

In general, the program should seek some mix of the following skills and experience: contacts with and knowledge of the area's business community, familiarity with federal and state clean air legislation and regulations, and public relations, promotional skills and experience.

4.2 FINANCING

Financing is needed only for administrative functions associated with operating a private trading program. The responsible public agency's financial needs should be quite limited, but can vary depending on the types of services provided by the agency. Generally, the more duties that are assumed, the greater will be the financial need. Any brokering duties taken on by the public agency, however, should be self-supporting and should not impose any additional demand on the agency's financial resources. Manuals on both public and private funding opportunities to support ERC funding have been developed by EPA's Controlled Trading Project Team and should be consulted for specific sources of financial aid for administrative duties related to ERC trading.

4.3 ARRANGING ON-GOING PUBLICITY EFFORTS

A successful trading program depends upon a good publicity effort to inform and interest potential participants. Both an initial effort to develop interest in the program and on-going information activities are necessary. An effective publicity campaign will include general information dissemination, technical assistance for potential ERC buyers and sellers, and a marketing effort to encourage active participation in the program.

- General information dissemination should focus on acquainting sources and organizations with the ERC trading program and how they can benefit by using it. Ideally, much of the neccessary dissemination will have occurred through public participation in the design of the program. Nonetheless, a follow-up to this public involvement should identify likely participants and develop an information strategy to inform them of trading opportunities. This could involve a standardized packet of information, briefings, or some combination of the two. At a minimum, the information should explain the mechanics and advantages of ERC trading. Potential users of an ERC trading program include local emitting sources, those organizations which could be instrumental in attracting new sources into the area, pollution control financing agencies and companies which are considering locating in the area.

- Technical assistance should be available to potential users of the trading program. Potential buyers and sellers will have specific questions about how they can participate in the ERC trading program. The agency should be able to supply detailed information to these participants as part of their information clearinghouse role.

- Promotional efforts will probably be an integral part of the agency's publicity strategy. In starting the trading program it may be necessary to take the initiative in developing community interest. The trading program's usefulness to businesses seeking to expand, relocate, or planning for expansion should be emphasized and participation encouraged.

In summary, the administrative support needed to run a private trading program includes personnel, financing, and publicity activities. Although the personnel and financing requirements are much less for private trading than for either of the other two systems, the publicity and information dissemination responsibilities are at least as important as in the other systems and are crucial for the success of private trading.

ONE BROKER'S EXPERIENCE

prepared by

Stuart Rupp
California Environmental Technology
Richmond, California

for

The Brokers' Conference
January 26, 1981

This paper describes one firm's experience with brokering emission reduction credits. From the firm's early involvement through its contract negotiations, the paper discusses the steps taken, problems encountered, and alternative strategies. The paper includes a draft contract and a list of useful air pollution terms.

ONE BROKER'S EXPERIENCE

STUART RUPP

CALIFORNIA ENVIRONMENTAL TECHNOLOGY
RICHMOND, CALIFORNIA

HOW I BECAME INVOLVED

When emissions offset and banking regulations were first promulgated in the San Francisco Bay Area our firm saw a potential business opportunity. At that time, two years ago, C.E.T. was already established as an industrial consulting firm. We had extensive experience assisting industries with their environmental management programs. Emissions offsets and reduction banking credits were a logical extension of our business.

We first evaluated the potential offsets in the Bay Area. Then we contacted the companies which had the largest quantity of offsets at the lowest reduction costs. Trade associations provided us with information about several companies which were potential offset sources. These associations helped us advertise by informing their membership about our services. All the prospective sellers we contacted were uninformed about the offset concept and the value of their emissions. At first they were incredulous. Sell pollution? But after hearing a thorough explanation they were very enthusiastic.

Agency agreements were set up with the sellers and we began contacting prospective buyers. To locate prospective buyers we used information from business publications and conversations with members of the business community. The contacts were made; and we were in business.

BROKERING

Emission reduction credit brokers provide industry with a valuable service. The broker will locate emission reduction sources (offsets), negotiate the contracts, and expedite the permit procedure, all resulting in profits for the client. Brokers assist new industry in starting operations within a community while protecting the community's interest in clean air. Both the public health and the local economy will improve.

TYPES OF INVOLVEMENT

The ERC broker may act as agent for either the purchaser or seller of emissions offsets. When representing either party the broker has the same responsibility - making a successful transaction.

The bases of the ERC transaction are the types and quantities of pollutants which are to be sold. This can be determined by first referring to the local air pollution control district's (APCD) source emissions inventory. Possible reductions are calculated using various abatement methods. The approximate value of the offsets is the sum of the reduction costs plus seller's profit. The final price will depend on market demand and the negotiating efforts of the parties. Emission reductions must be profitable. For the buyer there must be a return of investment. The seller must have an increase of profits.

A prospective seller may be reluctant to offer his offsets for sale because the concept is new and not a common industrial practice. It is up to the broker to instruct the seller on how the system works. A well prepared broker will carefully explain the ERC concept, and present cost and profit estimates. Once the prospective seller is educated, profit will be the inducement to sell.

Increases in operating or production costs may concern a prospective ERC seller. If the capital gained from an ERC sale is invested in more efficient abatement or process equipment there will be a long term increase in profits. It is the broker's job to show the seller how he or she can gain the maximum benefit from an ERC sale.

Compensation for a broker's services can be either a fixed hourly rate or, when representing a seller, a commission based on a percentage of the selling price of the ERC's. A commission arrangement will usually produce a substantially higher compensation than a fixed hourly fee because of the high risk invloved in all ERC transactions. Not only must a willing buyer be found but the entire sale is contingent upon the proposed new source obtaining the required air pollution operating permit. A broker will spend a great deal of time and incur substantial expenses in closing a transaction. He or she must find the offsets, find a prospective buyer, negotiate the contracts, help prepare the permit application, and carry the application through the permit review procedure. Therefore a commission must be commensurate with the effort, expenses, and risk involved.

Both buyer and seller will benefit by using an ERC broker. Because of a broker's expertise and negotiating skill, a buyer will make the best investment and a seller will enjoy the highest profit. A broker also allows the parties to an ERC transaction to remain anonymous until final negotiations. By being anonymous a buyer can prevent extraordinary sellers' profits when a major new source requires a large number of ERC's from a limited market. A seller can benefit from anonymity when the prospective buyer is a large company with sophisticated engineering and legal resources.

When representing either a buyer or seller of ERC's the broker has a fiduciary duty to his client. Situations may arise where the broker will receive compensation from both parties. In such a situation the broker must make full disclosure to both parties in order to avoid a breach of fiduciary duty. Because the broker will provide each party with valuable services, it is doubtful either party will object to a dual agency.

FINDING OFFSETS

A broker's success will depend on his or her ability to locate emissions offsets. Locating offsets requires imagination and creativity as well as skill and diligence.

Never overlook small sources. Often the large, more conspicuous emissions sources accumulate offsets for their internal use. Study the area and learn about all the industries. A street by street inspection of an industrial area may reveal several previously unknown offset sources. The local Chamber of Commerce and industrial development organizations can provide information about the industrial activities in an area.

When an offset source is located, contact that particular industry's trade association for information about similar operations in the area. Plant managers are very knowledgeable about similar or competing operations. Whether or not a new industry locates in an area may depend upon the availability of a large number of ERC's. Therefore a small offset source can benefit by helping to locate other offsets in the area.

Emissions from sources already controlled can often be reduced below regulatory limits. These excessive reductions are marketable offsets. For example, water base coatings can be used instead on solvent base systems. Excessive reductions resulting from this process change can be used as offsets.

Non-point sources are another source of offsets. A heavily traveled unpaved road produces a lot of particulate. Paving the road can cause a reduction of particulate which can be used as an emissions offset.

Mobile sources can also provide offsets. Converting a fleet of gasoline or diesel powered vehicles to LPG will result in a permanent, marketable emissions reduction.

A broker must be imaginative. Look to every source of air pollution as a potential source of emissions reductions.

THE CONTRACT

After preliminary agreements are made between the buyer and seller of emissions offsets the contract must be negotiated. The contract must state all the terms and conditions of the ERC sales agreement. Both parties stand to suffer losses if the contract is not complete or fails to correctly state their intentions.

Lengthy contracts should be avoided. A long, highly technical document may intimidate a party to the transaction or cause substantial legal expenses just to interpret the document. The best contract is clear and direct.

The buyer should make the seller's operating permits conditional upon the emissions reductions. This will prevent the buyer's permits from being revoked if the seller increases emissions from his or her operations. If the seller's operations do not require a permit, an agreement must be drafted giving the APCD the power to limit the seller's emissions below the regulatory limits. These assurances are formalized with a third party beneficiary contract; the APCD is named as beneficiary of the agreement with the power to enforce the contract.

The buyer should seek a single transaction for the purchase of the ERC's. Agreements requiring the buyer to provide the seller with fuel, maintenance, or other services should be avoided. Costs of long term commitments are unpredictable and may result in future losses for the ERC buyer.

Future operations of a new source will depend on the terms of the emissions offset contract. The document must be carefully drafted to fully protect the interests of the parties.

THE PERMIT APPLICATION

Acceptance of the air pollution operating permit application, including the offsets, is the last step of the ERC sales transaction. The broker must see that the application is complete and meets all the criteria for a new source permit. All operating, emissions, and offset data must be accurate.

A friendly working relationship with the APCD is essential. Antagonism between the broker and the APCD staff will only harm the client. APCD engineers are very knowledgeable about emissions control technology. They can offer helpful suggestions for complying with the new source review regulations.

Data presented in the permit application must accurately reflect actual operating conditions and emissions. Exaggerated numbers only invite delays and litigation.

The permit application must show an overall air quality benefit. This is easily demonstrated with direct emissions reductions in close proximity to the proposed new facility. However distant offsets will require mathematical modeling to show an air quality benefit. Modeling is expensive and controversial, and sometimes the results are unpredictable. If a model is required, use a model approved by the EPA. You must make sure the input data is correct, particularly the discretionary and interpretive data. The success of a model may depend on stack height or an interpretation of wind patterns.

Private environmental protection organizations can stop a project if their interests are not considered. A local planning agency will deny an application for a land use permit, even though an air pollution permit has been granted, if the community is adamantly opposed to a proposed new facility. Without a land use permit the issue of offsets is moot. It is advisable to meet with local environmental groups and gain their support. Aesthetics or wildlife habitat are often the issues of contention. If the company proposing to build the new facility promises to purchase wetlands to be dedicated as a wildlife sanctuary, or if the new facility is built with an aesthetically pleasing design the objections of the environmental groups may be satisfied. It is important to consider and mitigate the total environmental impact of a new facility.

Delay and litigation can be eliminated with proper planning. Prior to submission the permit application should be reviewed by both broker and applicant. Any anticipated problems can be resolved and the permit processed without delay.

BEING A BROKER

ERC brokering is a new business. Both government and industry are promoting it as a way of satisfying environmental regulations and stimulating industrial growth. A person willing to acquire the necessary knowledge and skills can look forward to financial success as well as contributing to the environmental health and economic wealth of the nation.

EMISSIONS OFFSET SALES AGENCY AGREEMENT

1. This agreement is made by and between ______________________________ herein called the Principal and California Environmental Technology, 102 Washington Avenue, Richmond, California, herein called the Agent.

2. The operations of the Principal's business at ______________________________ produce any or all of the air contaminants of hydrocarbons, sulfur oxides, nitrogen oxides, particulate, and carbon monoxide. A reduction of any or all of these air contaminants may result in a marketable emissions offset.

3. In consideration of the mutual covenants and conditions contained herein the parties, Principal and Agent, agree as follows:

   a. The Principal hereby appoints California Environmental Technology as Agent for the sale of offsets and sale of options to purchase offsets with the exclusive and irrevocable right to sell.

   b. The Principal shall pay to the Agent as compensation for services a fee of:

   ____

   c. The Agent shall not accept offers for the Principal. The Agent shall obtain and present written offers to the Principal for acceptance by the Principal.

   d. The Agent shall notify the Principal in writing of all offers to purchase the offsets and all offers to purchase options for the offsets.

   e. The term of this agreement shall be for _______ days, beginning ______________ and continuing thereafter until terminated in writing by either of the parties.

   f. The Agent shall not assign this contract without written consent of the Principal.

   g. The Agent may represent all parties to a sale of the offsets and collect compensation or commission from both of them provided there is full diclosure to each of the Principals of such dual agency.

   h. If within 180 days of the termination of this agreement the offsets or options for the purchase of the offsets are sold to anyone with whom the Agent has negotiated prior to final termination of this agreement the Principal shall pay to the Agent the compensation specified in subparagraph b, provided the Principal received the names of the prospective purchasers, in writing, from the Agent prior to the final termination of this agreement.

   i. In consideration of the above, the Agent agrees to use due diligence in the performance of his obligations under this agreement.

Principal:

____

____

____

Dated: ______________________________

Agent:

____

California Environmental Technology
102 Washington Avenue
Richmond, California 94801
(415) 233-9156

Dated: ______________________________

AIR POLLUTION TERMINOLOGY

COMPILED BY:

CALIFORNIA ENVIRONMENTAL TECHNOLOGY
RICHMOND, CALIFORNIA

ABATEMENT DEVICE: equipment used to reduce air pollutant emissions

AQCR: Air Quality Control Region

AQMA: Air Quality Maintenance Area

AQMP: Air Quality Maintenance Plan

BACT: Best Available Control Technology

BUBBLE: a concept developed to allow some plant operations to exceed emissions limits if the total emissions from the plant do not exceed the calculated emissions when all operations are emitting pollutants at the emissions limits; excessive emissions and excessive reductions are aggregated as if the plant was in a bubble

CFR: Code of Federal Regulations

CTG: Control Technology Guidelines (EPA)

EIR: Environmental Impact Report

EIS: Environmental Impact Statement

ERC: Emission Reduction Credit

LEAR: Lowest Achievable Emission Rate

MODELING: a mathematical procedure for determining the air quality impact of an air pollution source

NAAQS: National Ambient Air Quality Standards

NESHAPS: National Emission Standards for Hazardous Pollutants

NONATTAINMENT AREA (NA): an air quality control region where the NAAQS are exceeded

NSPS: New Source Performance Standards

NSR: New Source Review

OFFSET: an emission reduction from an existing source used to reduce the air quality impact of emissions from a new source

POLLUTANTS/AIR CONTAMINANTS:

- CO - carbon monoxide
- HC - hydrocarbons; organic chemical compounds
- NO_x - nitrogen oxides
- O_x - photochemical oxidant
- organics - hydrocarbons
- ozone - O_3 an allotropic form of oxygen
- particulate - airborne solid or liquid particles
- TRS - total reduced sulfur
- TSP - total suspended particulate
- SO_x - sulfur oxides
- VOC - volatile organic compounds

PSD: Prevention of Significant Deterioration

RACT: Reasonably Available Control Technology

SIP: State Implementation Plan

MARKET ANALYSIS OF EMISSION REDUCTION CREDITS

Prepared by

Michael E. Lukey
Glenn T. Reed
Brian D. Hillis

Engineering-Science
7903 Westpark Drive
McLean, Virginia 22102

for

The Broker's Conference

January 26, 1981

ABSTRACT

Is the market for emission reductions credits (ERCs) in a given area sufficient to support a broker's services? Controlled trading is a new, fast developing business in which brokers who act now have the opportunity to earn a substantial return on their investment. These returns can be achieved by buying and selling ERCs, by performing emission reduction audits, by helping clients to arrange bubbles, and by performing other related services that can save their clients considerable sums of money. The purpose of this paper is to describe a methodology that brokers can use to determine ERC supply and demand in a given area and to develop the information they will need to market their services aggressively.

MARKET ANALYSIS OF EMISSION REDUCTION CREDIT SUPPLY AND DEMAND

by

Michael E. Lukey
Glenn T. Reed
Brian D. Hillis

Is the market for emission reduction credits (ERCs)in a given area sufficient to support a broker's services? Through its controlled trading program (i.e., offsets, the bubble policy, and banking) the U.S. Environmental Protection Agency (EPA) has provided a general regulatory framework that has lead to the creation of an ERC market. ERC banks have been established in a number of states and localities. A limited amount of controlled trading of ERCs has occurred. These facts do not, however, prove that a sufficient market for ERCs exists in a specific state or locality. A market analysis is, therefore, the first question facing potential brokers before deciding to commit scarce capital and other resources to ERC trading activities.

Engineering-Science (ES) conducted a market analysis for Louisville, Kentucky. Based upon this analysis, a general methodology, the resource needs, and the time requirements for an ERC market analysis were identified. Although some of the techniques used in this analysis were specific to conditions in Louisville, the methodology used for this case study can be applied by brokers contemplating involvement in other geographic areas to determine how best to structure their brokerage services to suit the particular needs of an area.

MARKET AREA SELECTION

A potential broker must select the area in which to offer his or her services. Although the selection of a specific area may be dependent upon factors such as location unique to the individual broker, other characteristics can be identified that will be important determinates of whether of not a viable brokerage business can be developed in a particular area. The following are some general factors that will affect the selection of an area for establishing an ERC brokerage business:

- Existence of an ERC bank. EPA's controlled trading program is a new regulatory reform that has been developing rapidly throughout the nation. ERC banks have been established in Louisville, Kentucky; Portland, Oregon; and San Francisco, California. Many other areas are working to establish banks.

57

- Amount of existing pollution. If there are few emitting industrial facilities in an area, ERC creation would be extremely difficult. Thus, the area selected should already have a significant industrial base.

- Age of existing industrial base. An industrial base that consists of older industry that has retrofitted or must retrofit control equipment is more likely to provide a supply of ERCs than one that consists mostly of newer well-controlled facilities.

- Rapid industrial growth. Obviously, an area that is experiencing rapid industrial growth is a likely area in which to establish an ERC brokerage operation because ERCs will be needed as emission offsets to support that growth.

- Industrial growth limitations. Air pollution control regulations need not limit industrial growth, but, in nonattainment areas and areas where consumption of the Prevention of Significant Deterioration (PSD) air quality increments is limited, the controlled trading of ERCs can overcome these limitations to industrial growth.

The potential broker must weigh each of these factors when selecting a market area, but should understand that an area need not rank high on all of these characteristics to support an ERC market.

The selection of Louisville as a study area is illustrative of how these factors can be considered. Louisville was selected for the following reasons:

- The Jefferson County Air Pollution Control District (APCD), which is a joint pollution control agency for the City of Louisville and Jefferson County, was the first agency to establish an ERC bank. The Louisville bank has had more deposits and withdrawals that any other bank.

- Louisville has a substantial industrial base dominated by the automotive assembly, large appliance, synthetic rubber, and chemical industries. In addition, electric power generation is the major source of particulate and sulfur dioxide emissions.

- Louisville's industrial base is fairly old. The synthetic rubber and chemical industries were built shortly after World War II. The automotive assembly and large appliance industries are more recent but are nonetheless more than ten years old. Even these newer industries, however, are faced with new air pollution control regulations adopted in 1979.

- Industrial growth has not been rapid in Louisville during the past decade. Yet, some of the large industries in Louisville, such as B.F. Goodrich and Ford, have recently undertaken modernization and expansion of their existing facilities.

- Growth in Louisville will be limited because Jefferson County is a nonattainment area for particulates, sulfur dioxide, carbon monoxide, and ozone. Recognizing that the controlled trading of ERCs is an important method for an area to overcome the growth limitations caused by a nonattainment problem, the Jefferson County APCDS established an ERC bank.

Other areas may have a greater potential to support ERC brokerage services because they are stronger than Louisville in certain factors. Houston, for example, is experiencing very rapid industrial growth and is a nonattainment area. Many midwestern and eastern cities might adopt ERC trading as a means of encouraging modernization of older industrial facilities. Brokers should make a quick assessment of the potential demand for his or her services in a particular area before undertaking a more detailed analysis aimed at identifying specific services and clients likely to engage a broker in a particular locality.

GENERAL METHODOLOGY

Although the specific analysis will depend on the types of services the broker plans to offer, a general methodology for conducting a market analysis of the supply and demand for ERCs can be divided into the following steps:

- o Obtain necessary data. A site visit is essential to a detailed market analysis although much of the information needed can be obtained prior to a visit. This information can also enable the broker to screen the area to decide whether further analysis is warranted.
- o Determine potential ERC supply. Supply is one side of the equation defining a viable market. Without a potential supply of ERCs, brokers will be unable to successfully complete a transaction.
- o Assess ERC demand. The most difficult part of the analysis will be quantifying demand, but a number of possible measures of demand will be detailed in this paper.

Although the methodology consists of three steps, all three are somewhat interdependent and may be undertaken concurrently. Determining the ERC supply and assessing demand are the two most important steps and are the ones upon which brokers should focus their efforts.

Using this methodology, brokers will be able to answer a number of questions critical to the eventual success of their business venture. These questions include the following:

- o Do existing pollution control rules and regulations allow for the creation of an adequate supply of ERCs?
- o What restrictions are placed on who can create, own, and use ERCs?
- o Is there a sufficient potential ERC supply that can be obtained at a reasonable cost?

- Do existing industries in the area need ERCs to bubble or expand?

- Will new industries want to build in the area? Will they need ERCs for offsets?

- What will be the approximate cost of creating ERCs and the likely market price at which they can be sold?

These questions are oriented primarily towards brokers who would assist firms in purchasing and selling ERCs. The first step in addressing these and related questions is to develop a detailed understanding of the environmental and economic characteristics of targeted locality.

SITE VISIT

A market analysis requires a significant amount of information concerning existing rules and regulations, emissions reductions required by the State Implementation Plan (SIP), current emissions and air pollution control technology, industrial growth, existing ERCs in the registry, etc. Much of this informaion can be obtained prior to a site visit. Before visiting the potential market area, the broker should obtain as much information as possible to determine if brokerage services can be adequately sustained. An initial screening of this information should provide the potential broker with enough data to determine if the area is worth additional analysis. The techniques for this screening will be basically the same as those used in the detailed market analysis. There are some specific questions, however, that can be asked during the screening that could identify that there is no need to proceed. The following are some of these questions:

- Has an ERC bank been established? If not, does the local agency have plans to establish one? Controlled trading will be more difficult if there is no bank, but the bubble policy could provide a basis for some brokering services.

- Are there any ERCs listed in the registry? If so, who owns them? ERCs listed in the registry are obvious indicators of a potential supply.

- Have there been any ERC transactions? Were brokers involved in these transactions? Prior transactions are an obvious indication of a potential for a broker to enter the market.

- Has the SIP been approved by EPA? If the SIP has not been approved, a moratorium on growth may be in effect.

- Is there a nonattainment problem in the area or are PSD increments available? Unless there are limits on growth imposed because of air quality considerations, the market may be very limited.

Some of these questions can be answered quickly by contacting the local control agency. At this point, the broker can decide to continue the analysis by visiting the area to collect additional information, conclude that the market potential is too limited, and/or select another area that may be more promising. The broker should remember, however, that a preliminary screening may be inconclusive and a site visit is essential before the potential of an area can be completely evaluated.

Types of Information

To save time and money the broker can obtain the following types of preliminary information by telephone or through the mail:

- The State Implementation Plan (SIP)
- State and local regulations pertinent to controlled trading
- The emissions inventory
- Industrial growth projections
- A summary of ERCs in the bank
- Topographical and planning maps

Each of these types of information can be effectively used in the later steps of determining potential supply and assessing demand. The following sections explain in depth the sources for obtaining this information, the specific data and its uses, and potential problems or limitations of each type of information.

State Implementation Plan

Each state is required by the Clean Air Act (CAA) to submit a SIP to EPA. The SIP details the specific emissions reductions that the state proposes to obtain in order to attain and maintain National Ambient Air Quality Standards (NAAQS). To date, EPA has established primary NAAQS for total suspended particulates, sulfur dioxide, carbon monoxide, ozone, hydrocarbons, nitrogen dioxide, and lead. Although the NAAQS define acceptable air quality, it is the responsibility of the states to obtain sufficient emission reductions to ensure that these standards are attained. To accomplish this objective, each SIP will contain a summary of the emissions inventory, regulations for specific sources and categories of sources, and the projected growth in emissions that will not jeopardize reasonable further progress (RFP) towards attaining the NAAQS. Because ERCs are emissions reductions beyond those required by the SIP, the SIP defines the baseline by which controlled trading is bounded. Copies of the SIP can be obtained from the state air pollution control agency. In some cases, state agencies have delegated responsibilities for the SIP to local air pollution control agencies. The Air Pollution Control Association (APCA) publishes annually a directory of state and local agencies with each agency's address, telephone number, and directors. Care must be taken, however, to ensure that the latest version of the SIP is obtained because SIPs change frequently as new regulations are adopted or as old regulations are changed.

Local Regulations

Some state or local control agencies like the Air Pollution Control District (APCD) of Jefferson County, which is the local agency in Louisville, have written regulations or policies that pertain specifically to controlled trading. Such regulations establish the regulatory framework for controlled trading in a specific area and define who can bank, what qualifes as an ERC, who owns them, what restrictions are placed on their use, etc. The Jefferson County APCD, for example, has a written policy establishing the ERC bank, but has no specific bubble regulations. Louisville's banking rules, however, are not included in the SIP. In Kentucky, the Department of Natural Resources and Environmental Protection (DNREP) was responsible for preparing the SIP. DNREP reviewed the Jefferson County APCD regulations to ensure that they were as stringent as the State's own. Thus, the banking regulations are not specifically part of the SIP, but are incorporated by reference. Thus, a quick check with the state or local agency is necessary to ensure that all of the regulations have been obtained, including those in the SIP and those only referenced in it.

Emissions Inventory

Emissions inventories include a wealth of data on existing point sources of air pollution in a given area. The information in the emissions inventory will provide the basis for much of the broker's market analysis. Key information that can be gained by reviewing an inventory includes the following:

- The difference between a source's allowable and actual emissions may indicate which sources are likely to be able to create ERCs.
- The type of control device currently used may indicate that it can be replaced with a more efficient one which would create an ERC.
- Shutdown facilities can be identified easily from an updated inventory by looking at a facility's compliance code.

The inventory will be a broker's main source of information for identifying firms likely to participate in ERC transactions. Although there is wide variance in state and local inventory systems, most include the following information for each point source:

- Name of the company.
- Location of each emission point in Universal Transverse Mercator (UTM) grid coordinates.
- Address of the plant.
- Name of the plant's air pollution professional or plant manager.
- Type of process.
- Type of control equipment.

C2

- Efficiency of control equipment.

- Allowable and actual emission rates.

- Compliance status.

Depending upon the inventory system, other useful data may also be available in the emissions inventory.

The emissions inventory for state and local areas can be obtained from a number of sources. EPA's National Air Data Branch (NADB) in Research Triangle Park, North Carolina, maintains the National Emissions Data System (NEDS). NEDS is a computerized emissions inventory system with data for the entire country. Figure 1 is a copy of a NEDS report for a specific emission point. State agencies are required periodically to submit data to EPA Regional Offices for inclusion in NEDS. Unfortunately, NEDS may not be as good an inventory as those maintained by the individual states because it often is not updated as frequently as the states' data. Because EPA does not collect the data directly, it relies upon the states to ensure that data in the system are correct and inaccurate data is often not removed quickly from NEDS. It is difficult to separate bad data in NEDS from that which is good. Therefore, a broker should use NEDS data with caution and discuss its currency with knowledgeable local officials.

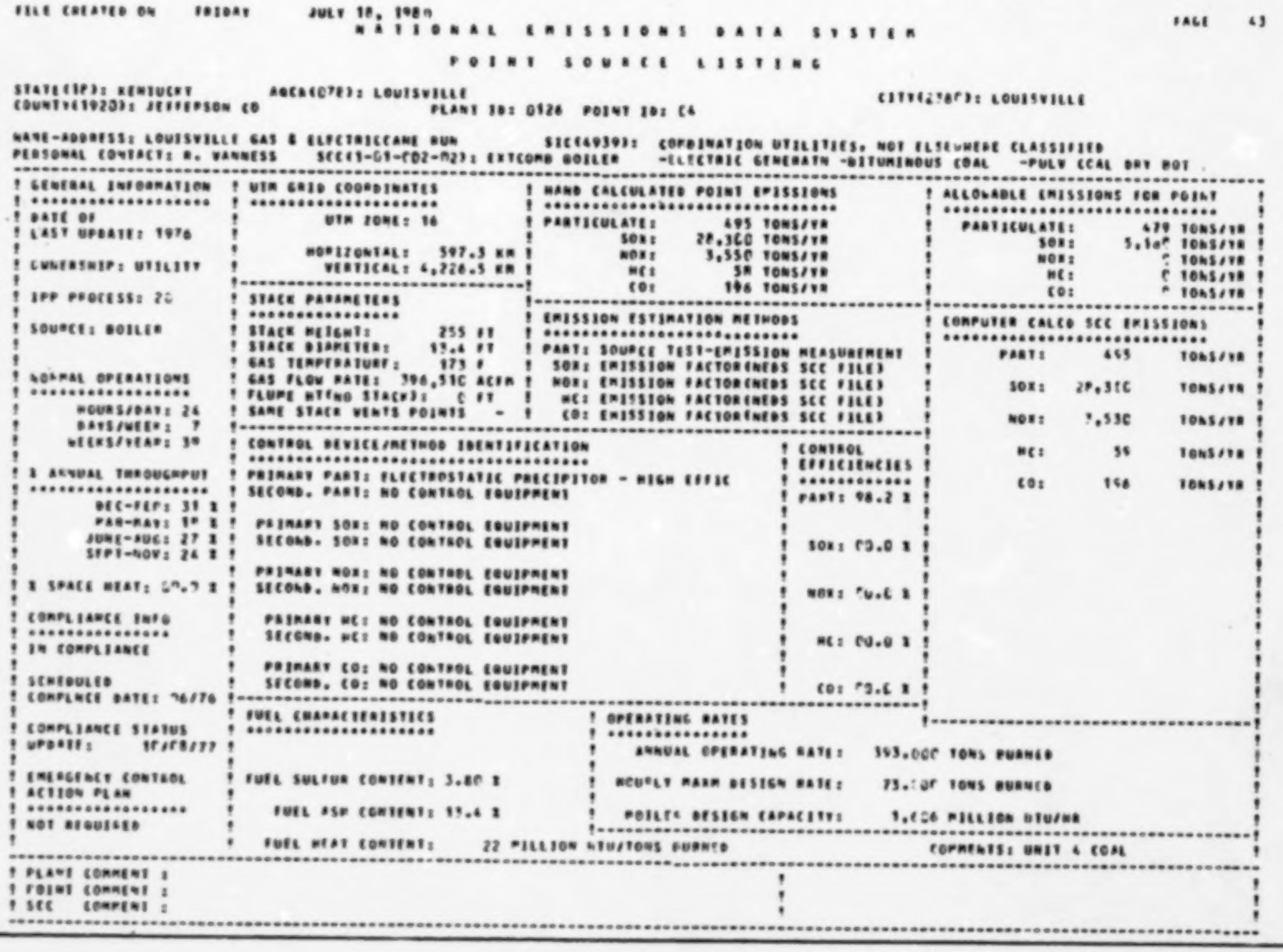
States also maintain an emissions inventory of their own. These inventories vary in quality but are generally superior to NEDS. Many states use the Emissions Inventory System/Permits and Registration (EIS/P&R), a computerized data handling system developed by EPA for use by the states. Figure 2 shows a copy of the EIS/P&R printout for air emission point in the Louisville inventory. EIS/P&R is similar in many respects to NEDS with regard to the type and format of information that can be stored in the system and, at a minimum, contains all of the information in NEDS. In addition, it is flexible enough to allow the state to include information like the projected emissions for the source, and it permits retrieval and summarizing of the data in various formats. Some states have developed new and very useful reporting formats. For example, both Kentucky and EPA Region IV have programs which allow plotting of point sources with brief summaries of emissions data. Since the location of particulate and sulfur dioxide ERCs is important to determining whether they can be used by a specific source seeking to bubble or offset emissions, this type of report can be very useful to brokers. Data processing personnel in the state or local agencies can provide the broker with a description of the various reports available from the agency's inventory system. If the analyst has access to a computer with an installed EIS/P&R system, the inventory could be obtained on a magnetic tape and the broker could then generate his own reports.

Industrial Growth Projections

Industrial growth projections are essential for quantifying the demand for ERCs. ERC demand will arise from two types of situations: existing firms that wish to expand or bubble and need ERCs to offset the additonal emissions that will result and from new industry moving into

FIGURE 1

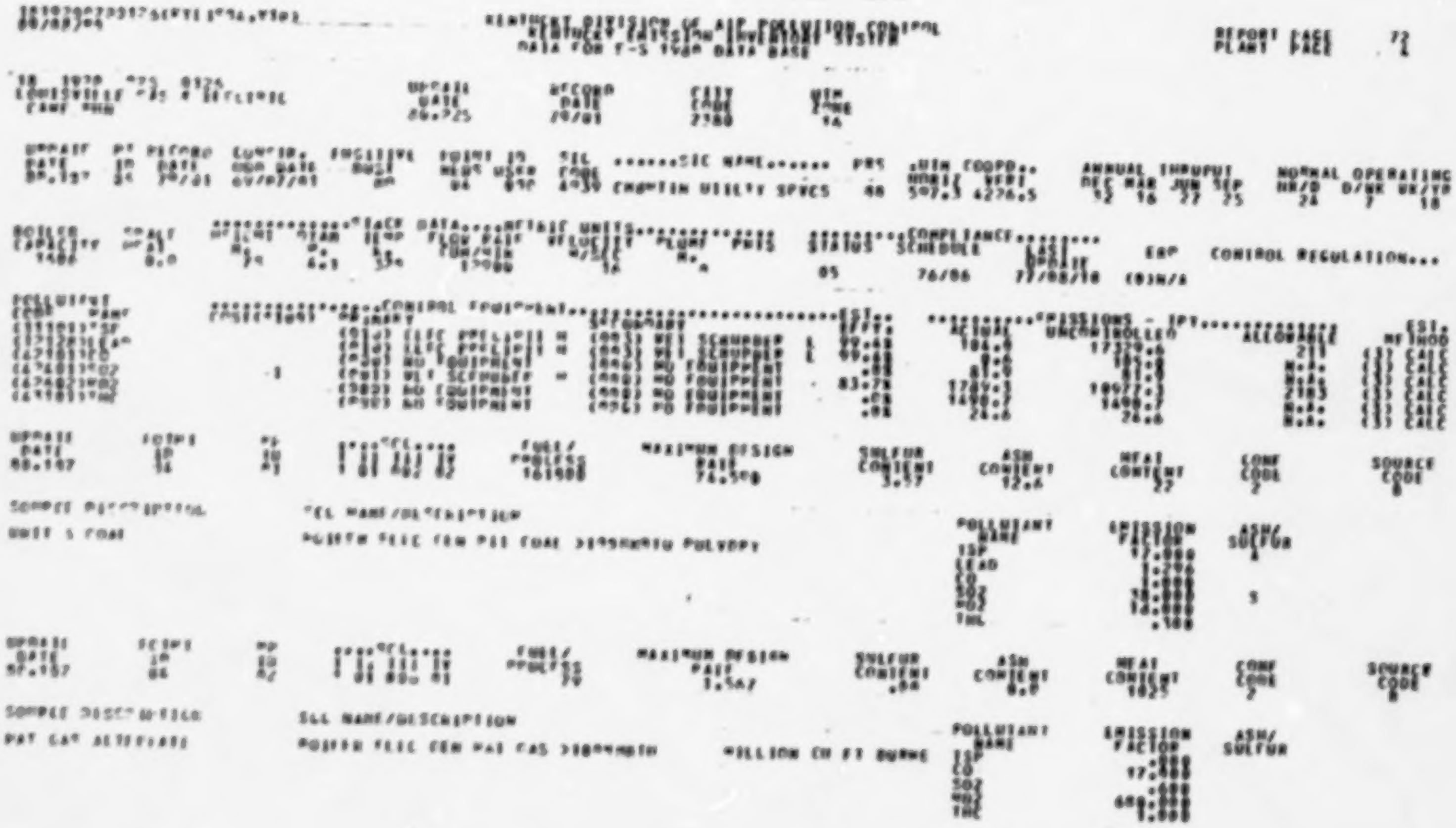
National Emissions Data System Point Source Listing



```
FILE CREATED ON    FRIDAY     JULY 18, 1980                                                          PAGE    43
                          N A T I O N A L   E M I S S I O N S   D A T A   S Y S T E M

                                        P O I N T   S O U R C E   L I S T I N G

STATE(18): KENTUCKY          AQCR(078): LOUISVILLE                                        CITY(2780): LOUISVILLE
COUNTY(1920): JEFFERSON CO                       PLANT ID: 0126  POINT ID: 04

NAME-ADDRESS: LOUISVILLE GAS & ELECTRICCANE RUN          SIC(4939):  COMBINATION UTILITIES, NOT ELSEWHERE CLASSIFIED
PERSONAL CONTACT: R. VANNESS    SCC(1-01-002-02): EXTCOMB BOILER    -ELECTRIC GENERATN -BITUMINOUS COAL   -PULV COAL DRY BOT
----------------------------------------------------------------------------------------------------------------------
! GENERAL INFORMATION  ! UTM GRID COORDINATES            ! HAND CALCULATED POINT EMISSIONS       ! ALLOWABLE EMISSIONS FOR POINT    !
! ******************** ! *********************           ! ********************************      ! ******************************** !
! DATE OF              !          UTM ZONE: 16           ! PARTICULATE:        495 TONS/YR       !   PARTICULATE:       479 TONS/YR !
! LAST UPDATE: 1976    !                                 !         SOX:     28,360 TONS/YR       !           SOX:     5,100 TONS/YR !
!                      !       HORIZONTAL:   597.5 KM    !         NOX:      3,550 TONS/YR       !           NOX:         0 TONS/YR !
! OWNERSHIP: UTILITY   !         VERTICAL: 4,226.5 KM    !          HC:         58 TONS/YR       !            HC:         0 TONS/YR !
!                      !---------------------------------!          CO:        196 TONS/YR       !            CO:         0 TONS/YR !
! IPP PROCESS: 20      ! STACK PARAMETERS                !---------------------------------------!----------------------------------!
!                      ! ****************                ! EMISSION ESTIMATION METHODS           ! COMPUTER CALCD SCC EMISSIONS     !
! SOURCE: BOILER       ! STACK HEIGHT:          255 FT   ! *****************************         ! ******************************** !
!                      ! STACK DIAMETER:       13.4 FT   ! PART: SOURCE TEST-EMISSION MEASUREMENT!       PART:     495     TONS/YR  !
!                      ! GAS TEMPERATURE:       173 F    !  SOX: EMISSION FACTOR(NEDS SCC FILE)  !                                  !
! NORMAL OPERATIONS    ! GAS FLOW RATE:  396,510 ACFM    !  NOX: EMISSION FACTOR(NEDS SCC FILE)  !        SOX:  28,360     TONS/YR  !
! *****************    ! PLUME HT(NO STACK):     0 FT    !   HC: EMISSION FACTOR(NEDS SCC FILE)  !                                  !
!       HOURS/DAY: 24  ! SAME STACK VENTS POINTS    -    !   CO: EMISSION FACTOR(NEDS SCC FILE)  !        NOX:   3,550     TONS/YR  !
!        DAYS/WEEK:  7 !---------------------------------------------------------------------------!                                  !
!      WEEKS/YEAR: 39  ! CONTROL DEVICE/METHOD IDENTIFICATION                 ! CONTROL           !         HC:      59     TONS/YR  !
!                      ! ************************************                 ! EFFICIENCIES      !                                  !
! % ANNUAL THROUGHPUT  ! PRIMARY PART: ELECTROSTATIC PRECIPITOR - HIGH EFFIC  ! *************     !         CO:     196     TONS/YR  !
! ******************** ! SECOND. PART: NO CONTROL EQUIPMENT                   ! PART: 98.2 %      !                                  !
!        DEC-FEB: 31 % !                                                      !                   !                                  !
!        MAR-MAY: 18 % !  PRIMARY SOX: NO CONTROL EQUIPMENT                   !                   !                                  !
!       JUNE-AUG: 27 % !  SECOND. SOX: NO CONTROL EQUIPMENT                   !  SOX: 00.0 %      !                                  !
!       SEPT-NOV: 24 % !                                                      !                   !                                  !
!                      !  PRIMARY NOX: NO CONTROL EQUIPMENT                   !                   !                                  !
! % SPACE HEAT: 50.7 % !  SECOND. NOX: NO CONTROL EQUIPMENT                   !  NOX: 00.0 %      !                                  !
!                      !                                                      !                   !                                  !
! COMPLIANCE INFO      !   PRIMARY HC: NO CONTROL EQUIPMENT                   !                   !                                  !
! ***************      !   SECOND. HC: NO CONTROL EQUIPMENT                   !   HC: 00.0 %      !                                  !
! IN COMPLIANCE        !                                                      !                   !                                  !
!                      !   PRIMARY CO: NO CONTROL EQUIPMENT                   !                   !                                  !
! SCHEDULED            !   SECOND. CO: NO CONTROL EQUIPMENT                   !   CO: 00.0 %      !                                  !
! COMPLNCE DATE: 06/76 !--------------------------------------------------------------------------!                                  !
!                      ! FUEL CHARACTERISTICS              ! OPERATING RATES                       !----------------------------------!
! COMPLIANCE STATUS    ! ********************              ! ***************                                                          !
! UPDATE:     10/08/77 !                                   !    ANNUAL OPERATING RATE:   393,000 TONS BURNED                          !
!                      !                                   !                                                                          !
! EMERGENCY CONTROL    ! FUEL SULFUR CONTENT: 3.80 %       !  HOURLY MAXM DESIGN RATE:    75.00 TONS BURNED                           !
! ACTION PLAN          !                                   !                                                                          !
! *****************    !    FUEL ASH CONTENT: 13.4 %       !   BOILER DESIGN CAPACITY:    1,026 MILLION BTU/HR                        !
! NOT REQUIRED         !                                   !--------------------------------------------------------------------------!
!                      !   FUEL HEAT CONTENT:     22 MILLION BTU/TONS BURNED                   COMMENTS: UNIT 4 COAL               !
----------------------------------------------------------------------------------------------------------------------
! PLANT COMMENT :                                                !                                                    !
! POINT COMMENT :                                                !                                                    !
! SCC   COMMENT :                                                !                                                    !
----------------------------------------------------------------------------------------------------------------------
```

FIGURE 2

Kentucky Emission Inventory System



C5

the area. Industrial growth projections provide a basis for estimating ERC demand that results from new and expanding industrial growth. Projections are normally extrapolations from the existing industrial base using particular assumptions about the national, state, regional, and/or local economy. Industrial growth is projected in terms of number of employees or earnings. In many projection series, key industrial groupings identified by the first two digits of the SIC code are projected separately. It is important for the broker to obtain projections segregated by two-digit SIC because some industrial groupings tend to have greater air pollution problems and, thus, need ERCs more than others.

Industrial growth projections can be obtained from various sources. The SIP may contain some projections. These projections will normally be those developed by local planning agencies in response to program requirements directed by the federal government. More recent and detailed projections may be available from the planning agencies and other organizations such as the Chambers of Commerce. One particularly useful source of projections is the U.S. Bureau of Economic Analysis, which publishes a series called OBERS which are commonly used in a variety of economic planning activities by the federal government. OBERS projections are based upon specific assumptions about the national economy. Projections for Standard Metropolitan Statistical Areas (SMSAs), which are the smallest areas for which specific OBERS projections are given, are disaggregated from the projections for the national economy. Thus, the quality of OBERS projections decreases as the size of the area becomes smaller.

Most local planning agencies, however, project employment trends for their local area. The Louisville and Jefferson County Planning Commission has employment projections for major industrial categories. These categories are designated by the first two digits of the four-digit SIC code. Louisville's projections are based on a questionnaire survey of local industry. Thus, expansion plans of local industry are reflected more than growth from new industry. Table 1 shows the industrial growth rate projections for Louisville obtained from the Louisville and Jefferson County Planning Commission. Although initial contacts by letter or telephone may be sufficient to obtain growth projection data, these data may be obtained best during a visit to agencies likely to have these data. There may be conflicting sources of growth data, and the broker may not be able to judge the quality of the data except through discussions with personnel responsible for developing these projections.

ERC Registry

To determine the current supply of ERCs, the broker should obtain a copy of the current ERC registry from the agencies responsible for administering the ERC bank. Table 2 is a copy of the current ERC registry. It includes the following information:

- Name of the depositor.
- A personal contact for the depositor with a telephone number.
- The ERCs banked for each depositor by pollutant.

TABLE 1

PROJECTED GROWTH RATES BY 2-DIGIT SIC (PERCENT)

		Low		Medium		High	
SIC	Industry Group	1973-1985	1985-2000	1973-1985	1985-2000	1973-1985	1985-2000
20	Food	-10.5	-17.5	-7.2	-14.1	-4.4	-11.4
21	Tobacco	-3.2	9.6	0.3	14.1	3.4	17.8
22	Textiles	-22.4	-14.4	-19.2	-10.9	-16.8	-7.7
23	Apparel	26.6	16.8	31.2	21.6	35.2	25.5
24	Lumber	-18.3	-14.3	-15.3	-10.3	-12.8	-7.9
25	Furniture	-0.1	11.6	3.5	16.2	6.6	19.9
26	Paper	15.0	12.6	19.2	17.2	22.8	20.9
27	Printing	-5.4	10.9	-2.0	15.4	1.0	19.1
28	Chemicals	5.7	6.9	9.6	11.2	12.9	14.8
29	Petroleum	-10.3	13.9	-7.4	19.0	-4.4	22.3
30	Rubber	46.1	42.2	51.4	48.1	56.1	52.7
32	Stone	31.3	4.5	36.1	8.7	40.2	12.2
33	Primary Metals	21.6	14.3	26.1	18.9	29.9	22.8
34	Fabricated Metals	11.4	12.1	15.5	16.7	19.0	20.4
35	Machinery, Nonelectric	20.9	7.7	25.3	12.1	29.1	15.7
36	Electric Machinery	54.7	35.5	60.4	41.0	65.3	45.6
37	Transportation	77.6	13.0	84.1	17.6	89.7	21.3
38	Instruments	23.7	20.2	28.2	25.0	32.1	28.9
39	Miscellaneous	-9.9	-2.0	-6.6	1.9	-3.7	5.2

Source: Louisville and Jefferson County Planning Commission (1979).

TABLE 2

JEFFERSON COUNTY, KENTUCKY
EMISSIONS BANK STATUS REPORT[a]
(July 31, 1980)

Depositor	Contact	Phone Number	Pollutant Tons/Year		
			TSP	SO_2	VOC
B.F. Goodrich Company	W.C. Holbrook	216-524-0200	417.1	-----	687.7
Logan Company	R.C. Hunt, P.E.	502-587-1361	22.0	36.0	-----
General Electric	Keith Moser	502-452-5678	197.0	-----	70.0
International Harvester	J.F. Mavri	502-367-3226	329.0	-----	348.0
Ford Motor Company	A.M. Twilley	313-323-2845	-----	-----	343.0
Philip Morris	Tom Scott	304-271-2474	41.2	464.3	0.7
Unallocated	A.P.C.D.	502-587-3327	15.0	101.0	-----
Totals			1021.2	601.3	1449.4

[a] Interested parties can also contact: M.T. DeBusschere, P.E., Air Pollution Control District at 502-587-3327, or Stan Bowling, Louisville Area Chamber of Commerce at 502-582-2421.

The registry in Louisville also includes the name and telephone number of personnel at the agency and at the Louisville Area Chamber of Commerce who interested parties can contact. Note that unallocated ERCs listed in the registry belong to the Jefferson County APCD.

The ERC Registry is an important source of information for brokers interested in finding ERCs for clients seeking to expand or to utilize the bubble policy. It also provides brokers with a sense of the market for creating ERCs.

Topographic and Planning Maps

It is generally a good idea to obtain maps of an area before undertaking any type of field reconnaisance. The U.S. Geological Survey (USGS) publishes 7 1/2' topographic maps that provide substantial information. Large industrial complexes can be easily identified on these maps. Most importantly, because these maps also use the UTM coordinate system, which most emission inventories use to locate point sources, they can easily be used for showing the location of emission sources. Other maps, particularly planning maps showing present and future land use patterns, can be obtained during the site visit. These maps provide an indication of where, because of zoning regulations, new industrial growth is likely to occur.

Stops to Make on a Site Visit

After collecting background information, a broker examining the feasibility of entering an area to provide services will want to make a site visit to complete his or her market analysis. The purpose of this visit is to learn more about the regulations, the emissions inventory, and the community and to meet with key individuals responsible for administering the controlled trading program. At a minimum, the analyst should visit the following agencies:

- Air pollution control agency. The control agency is responsible for regulating controlled trading as well as the overall air quality management program. Normally, agency personnel will have an intimate knowledge of air pollution sources and their ability to create and use ERCs.

- Planning agencies. Local planning agencies prepare industrial growth projections, are involved in the transportation and land use planning and are generally involved in the interrelationship between air quality and planning. They also are the responsible local agency for zoning.

- Chamber of Commerce. As the representative of local industry, the Chamber of Commerce often has information on industrial development sites and is most aware of the needs and problems of local industry.

- Industrial development agencies. These agencies will have information on major areas where development may occur. They also act as the primary group involved in attracting new industry to an area and in developing programs to retain existing firms.

- Industrial bonding authorities. Financing will be an important factor in obtaining ERCs and can be an important service for brokers to provide. Industrial development revenue bonds, which are administered by these agencies, may be a useful financing mechanism.

The air pollution agency should be visited first because agency personnel can usually direct the analyst to specific personnel in the other agencies. In Louisville, all of the agencies in this list were very cooperative and provided considerable useful information.

Not surprisingly, the local air pollution control agency has a wealth of information useful to a potential broker. Not only does the agency regulate air pollutant emissions, but it is the agency responsible for establishing the controlled trading regulations. Prior to visiting the agency, the broker should review the agency's regulations and be prepared to ask any questions necessary to clarify particular points. The agency will also be able to identify any modifications in the emissions inventory that have not been incorporated into the latest published report. Because agency personnel inspect sources routinely, they should be aware of any likely ERC suppliers and also be able to identify firms who may have a demand for ERCs to bubble or to offset expansion. All local and state agencies require new sources to obtain construction permits. Thus, the agency would also have information about recent growth. The most important information that a broker can obtain from an agency may be personal contacts from whom further information can be gained. Local control agency personnel are also the people with whom the brokers will eventually be dealing when arranging for certification and evaluating proposed uses of ERCs.

Local planning agencies normally have a number of specific functions. Some of these functions include the following:

- Preparing a comprehensive growth plan.
- Planning for transportation to serve the needs of the community.
- Reviewing and processing rezoning applications.
- Maintaining zoning maps and files.
- Reviewing and processing building permits.

In some areas, these functions may be split between several planning agencies or other governmental entities. For example, in Louisville, the Kentuckiana Planning and Development Agency is responsible for transportation planning, and the Louisville and Jefferson County Planning Commission has control of all of the other planning functions.

The local planning agencies can provide the broker with industrial growth projections; current population, employment, transportation, and land use data; and detailed maps depicting current and future land use patterns. Industrial growth projections are an important factor in predicting ERC demand. Current land use maps and data can be used in conjunction with the emissions inventory to identify and locate potential sources of supply. The projected land use maps can be used in assessing and locating potential new growth areas that may generate ERC demand. Together with current land use maps, these maps will also help the broker to relate ERC supply and demand spatially for pollutants such as particulates and sulfur dioxide which is important because ERC use must not degrade air quality. This will be dependent upon the location of the supplier relative to the user for these pollutants. Other types of information that the planning agencies can provide, such as population and housing characteristics, will enable the broker to assess, in a general way, the area's attractiveness to new industry.

The Chamber of Commerce is a good source of general information about the local economy because it is the representative of all of the industry in the area. In Louisville, the Chamber was able to provide useful information including detailed maps on industrially zoned development sites. The Chamber was quite helpful in providing general data such as value of goods and services produced and sold, local labor market characteristics, recent development activity, employment by local industry, and tax rates. The Chamber in Louisville currently acts as a liaison between the air pollution control agency and local industry for disseminating information about the controlled trading program.

Industrial development agencies are charged with the responsibility of promoting industrial development. In Louisville, there are several agencies at the city, county, and regional level with this responsibility. In addition, the Riverport Development Authority is responsible specifically for promoting development at the Riverport Industrial Park. Development personnel can provide information on recent developments and on current development plans. They know the types of firms interested in moving to the area. Often, they have developed a comprehensive program to entice firms to their area. They also are aware of the problems and needs of existing industry with regard to air pollution. Normally, however, they are reluctant to discuss the specific plans of individual firms.

ERC financing may be an important issue for firms contemplating an ERC transaction. Industrial review bonds may be an important source of capital for financing ERCs. Bonds may be issued by a number of different local governmental agencies in Louisville. One such agency, Office of Economic Development (OED) for Jefferson County, was contacted in Louisville. OED provided a list of recent bond issues by the Jefferson County Fiscal Court (see Table 3). Industrial revenue bonds are intended to promote industrial development in the area. They can be used to finance a wide variety of projects although there are restrictions on their use with regards to the total investment of which the bonds are part. In fact, many recent issues in the Louisville area have supported commercial development. Bond issues have been rather small, except for recent issues for Stauffer Chemical Co. and Phillip Morris. The largest recent issue by the Fiscal Court was $3,000,000 for Drum Engineering Company. Bonds are not normally issued for public sale but are bought by banks and other financial institutions immediately upon issue. In fact, the County would probably not issue bonds unless a buyer was already available. Banks in Kentucky are limited in size by state laws prohibiting branch backing, but no one contacted in Louisville felt that these

71

TABLE 3

SUMMARY OF RECENT INDUSTRIAL REVENUE BOND ISSUES BY THE OFFICE OF ECONOMIC DEVELOPMENT JEFFERSON COUNTY FISCAL COURT

Court Date	Bond Applicant Name	Size of Issue	Job Creation Data # Jobs/ Years	Annual Payroll	Capital/ Job	Capital/ Payroll $	Job Security Enhanced	Nature of Business
7/24/79	Altamil Corp.	$ 500,000	25/2	$300,000	$ 20,000	$ 1.67		Operates fabricating & truck equipment; acts as installing facility
10/1/79	Jaggers Equip., Co.	220,000	6/1	48,000	36,666	4.58		Railroad car seats
11/1/79	Ennis Business Forms	1,000,000	30/2	325,000	33,333	3.08		Business form distribution
2/26/80	K&R Corporation	2,000,000	16/3	225,000	125,000	8.89		Scrap metal
4/8/80	Industrial Belt & Supply	250,000	5/2	100,000	50,000	2.50		Conveyor belts mfg./ supply/distribution
4/8/80	Bunton Co., Inc.	475,000	50/2	750,000	9,000	.60		Lawn care equipment mfg. & distribution
4/22/80	Lacy Diversified, Inc.	1,000,000	6/1	75,000	166,666	14.29		Waste paper disposal
6/24/80	Manning Equip., Ind.	1,400,000	50/2	800,000	28,000	1.75		Truck body manufacturer
7/30/80	Snider Bolt & Screw	600,000	10/3	150,000	60,000	4.00		Bolt & screw warehouse, sales & distribution
8/19/80	Stauffer Chemical Co.	1,000,000					154	Chemical products mft. plant
8/19/80	Philip Morris	1,000,000					3,850	Tobacco products manufacturers
8/19/80	Drum Engineering Co.	3,000,000	29/3	435,000	103,000	6.90	9	Mfg. & distribution of pumps
9/9/80	S.W. Jeff. Skateland	550,000	26/3	95,000	21,000	5.79		Rollerskating rink
9/23/80	Cincinnati Elec. Equip.	250,000	8/3	160,000	31,250	1.56		Electric motor distrib. & repair

TABLE 3--Continued

SUMMARY OF RECENT INDUSTRIAL REVENUE
BOND ISSUES BY THE
OFFICE OF ECONOMIC DEVELOPMENT
JEFFERSON COUNTY FISCAL COURT

Court Date	Bond Applicant Name	Size of Issue	Job Creation Data				Job Security Enhanced	Nature of Business
			# Jobs/ Years	Annual Payroll	Capital/ Job	Capital/ Payroll $		
10/14/80	Byck Bros. & Company	2,100,000	49/3	421,000	42,857	4.99	211	Ladies fashion apparel
10/28/80	L&L Enterprises	1,000,000					38	Land developers/industrial park
10/28/80	Vulcan Land Co.	1,600,000	50/3	830,000	32,000	1.928	38	Auto exhaust pipe mfg.
11/12/80	Eduplay, Inc.	2,500,000	80/1	800,000	31,250	3.125	300	Health care/aged
11/12/80	A. Arnold & Son	600,000	10/3	115,432	60,000	5.198	30	Moving & storage

limits would seriously affect financing of ERCs or industrial development. The following conclusions can be drawn concerning ERC financing using industrial revenue bonds:

- Bonds may be in some circumstances be used to finance the purchase or creation of ERCs.
- The amount of financing of ERCs through bonds would be limited by the rules for their issuance. Projects for smaller firms are more likely to be financed through bonds.
- Negotiation with banks and other bond purchasers should be undertaken prior to issuance to ensure that there will be a buyer for the bonds.

Thus, the broker should consider industrial revenue bonds as a potential source of ERC financing but should contact local bonding authorities for assistance in identifying the potential and method for tapping this source of capital.

ESTIMATING THE SUPPLY OF ERCs

The next step in the market analysis is to determine the potential ERC supply, i.e. to identify firms likely to create ERCs for each pollutant, the manner in which they will be created, their costs, and quantity. In order order to determine the potential supply of ERCs, the following steps are necessary:

- Review local regulations. This review should concentrate on identifying any restrictions or creating ERCs and the level of control required on existing sources.
- Define the controlled trading baseline. Since ERCs must be emissions reductions beyond the limits in the SIP, it is important to determine those limits.
- Analyze existing ERCs in the bank. The broker should analyze banked ERCs to determine if any are available to be traded.
- Identify ERCs available from plant shutdown. Plant shutdown can be a major source of ERCs.
- Quantify ERCs available from further controls. ERCs can also be obtained by installing more efficient control equipment.
- Consider the potential for obtaining ERCs from small point sources, area sources, and mobile sources. In many areas, pollution from these sources constitute a large percentage of total area emissions.

These steps can be undertaken using only the information discussed previously without contacting specific industries. The overall purpose of these efforts is to get a general sense of the quantity and likely sources of ERC supply.

Local Regulations

The local air pollution control regulations will establish the regulatory framework within which controlled trading will occur. Important considerations in reviewing the regulations include the following:

- Ownership of ERCs. Unless ownership rights to ERCs are clearly defined in in the banking regulations, a market may not be viable because of the legal uncertainty. For example, both a firm and the state may claim the right to credit from shutdowns.

- Rules for the creation of ERCs. EPA has allowed state and local agencies significant latitude in permitting or disallowing particular ERC creation mechanisms, e.g., plant shutdowns and curtailments, fuel switches, etc.

- The role of plant shutdowns in ERC creation. Shutdowns can be the most plentiful source of ERCs, but some agencies may not grant credit for reductions from shutdowns because they had already been counted in the design of the attainment strategy for the SIP.

- Time limits and discounting. Some banking programs may limit the usefulness of ERCs to a specific time limit or may provide for discounting in situations where additional controls will be needed to attain the standards.

- Existing controls. Local regulations will define the level of air pollution emission controls that existing sources must achieve. As a result of the changes in 1977 to the CAA, these control levels will be defined as reasonable available control technology (RACT). But what is defined as RACT can vary significantly across communities.

- Further controls. Some local agencies may have imposed more stringent controls on existing industry or required controls on previously uncontrolled emission sources as a result of the 1977 amendments to the CAA. In particular, VOC sources which in many areas of the country were not controlled are now required to install RACT as a result of many of the 1979 SIP revisions. Normally, agencies allow sources which must install new controls a period of time defined as a compliance schedule within which to institute the required controls. Because these sources are required to put in controls, and may at the same time create surplus reductions, they are likely clients for a broker.

In reviewing the state or local regulations, the broker needs to identify factors that may limit his or her ability to provide services to clients. In general, simple regulations that provide for the consistent and permanent creation and use of ERCs will further the ERC market and provide a favorable climate within which the broker can operate. Complexities such as requiring offsets for indirect emissions or confiscating ERCs after only a few years can significantly limit the potential market and therefore restrict the activities of brokers.

Genuine Emissions Reductions

Since ERCs must be emissions reductions beyond those necessary to attain the NAAQS, the broker must establish the controlled trading baseline to determine if potential ERCs are genuine. Many of the services provided by brokers will involve the determination of whether a potential reduction qualifies as an ERC. Emission reductions which cannot be considered genuine ERCs include the following:

- o Plant shutdowns and other reductions that have been counted in the SIP towards achieving reasonable further progress (RFP).
- o RACT controls on categories of VOC sources that are scheduled to be imposed in the future.
- o Paper reductions that can be created by redefining allowable emissions.

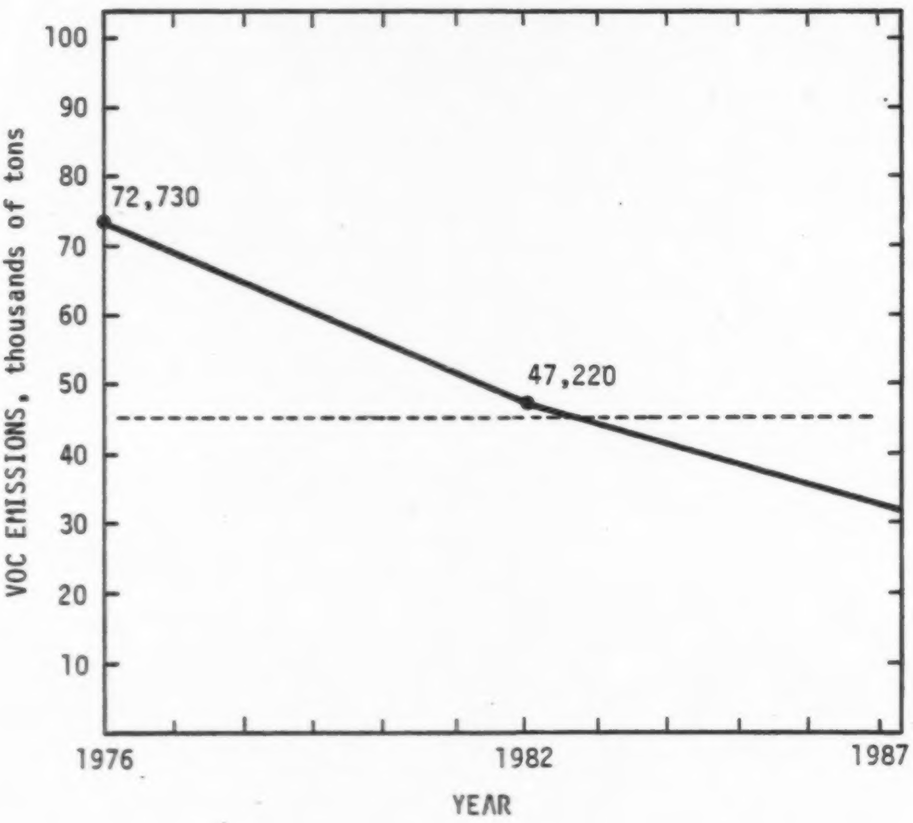
The SIP will provide the broker with the necessary information to determine the acceptability of emissions reductions for the purpose of banking and trading.

The RFP section of the SIP is the most important portion for the broker to review in order to establish the controlled trading baseline. Each SIP contains an RFP curve which demonstrates emission reductions that must be achieved by the agency each year until the standards are met. The RFP curve for VOC emissions in Jefferson County is shown in Figure 3. Table 4 summarizes the VOC emission reductions needed in Jefferson County in order to attain the ozone NAAQS. Although reductions from plant shutdowns have not been counted in the Kentucky SIP, some states have estimated that a percentage of the emissions will be eliminated through shutdown and count these reductions towards RFP. In these cases, ERC creation through plant shutdown would be limited to those reductions in excess of the amount required for RFP. Kentucky has correctly, however, taken credit for reductions resulting from the imposition of RACT on VOC source categories that are not regulated in the 1979 SIP. These regulations are being developed now and will become effective during the 1979-1987 period. The source categories due to be regulated are listed in Table 5. Daily reductions from these source categories in excess of RACT controls will qualify to be banked.

Finally, most SIPs are based on actual emissions rather than allowable. Because allowable emissions in most areas are based upon the assumption that all sources operate continuously unless otherwise restricted, paper reductions are possible for many firms by simply redefining allowable emissions as actual. In many cases, this redefinition could result from simply accepting permit conditions restricting hours of operation. If the SIP is not based on allowable emissions, no credit can be obtained through such paper reductions. Brokers will probably have to discuss the SIP process with the local agency personnel in order to properly interpret and define the controlled trading baseline to ensure that potential ERCs are genuine.

76

Reasonable Further Progress for VOC Emission in Jefferson County



77

TABLE 4

SUMMARY OF VOC EMISSION REDUCTIONS FOR JEFFERSON COUNTY

JEFFERSON COUNTY HC EMISSION REDUCTIONS (TONS/YEAR)			
	1976	1982	1987
Uncontrolled VOC Emissions	72,730	77,010	81,340
RACT	0	8,320	17,320
Federal Motor Vehicle Cont. Program (FMVCP)	0	17,790	27,980
Mandatory Vehicle I/M Program	0	2,210	3,730
Transportation Strategies	0	1,470	1,080
Controlled Emissions	72,730	47,220	31,230
Emissions Necessary to Attain the Standard[a]	44,365	44,365	44,365
Additional Reductions Needed to Attain the Standard[a]	28,365	2,855	----

TABLE 5

VOC SOURCE CATEGORIES THAT WILL BE CONTROLLED AFTER EPA PUBLISHES ADDITIONAL CONTROL TECHNOLOGY GUIDELINES

- Pharmaceutical Manufacture
- Rubber Products Manufacture
- Paint Manufacture
- Vegetable Oil Processing
- Graphic Arts (Printing)
- Flat Wood Products
- Service Stations, Stage II
- Organic Chemical Manufacture
    - Process Streams
    - Fugitive (Leaks)
- Wood Furniture Manufacture
- Architectural and Miscellaneous Coatings
- Organic Chemical Manufacture
    - Waste Disposal
    - Storage and Handling
- Natural Gas and Crude Oil Production

ERCs Listed in Banking Registry

The summary of ERCs listed in the registry should be reviewed. All ERCs in the bank should be considered tradeable. Yet, some ERCs may be difficult to obtain. In Louisville, a few small industries have banked ERCs. These ERCs may be obtained more easily for trading because the owners are less likely to need them than larger firms with expansion plans. Similarly, the Jefferson County APCD owns a limited number of ERCs in the bank. APCD regulations allow these ERCs to be auctioned publicly. Thus, they should be considered a readily available supply of ERCs. The analysis of the ERC bank should also include a review of the past use of banked ERCs. B.F. Goodrich, for example, has already used a substantial portion of their ERCs to modernize their plant. They may, therefore, have no further immediate use for their remaining ERCs and may be willing to sell all or part of their remaining account. International Harvester traded ERCs to a company as part of a subcontract agreement. Thus, a quick review of past ERC transactions may give indication of a firm's willingness to sell its ERCs. Current ERCs in the bank, however, must not be considered as the only or main supply of ERCs for the broker. Brokers will want to actively work with their clients to create low-cost ERCs.

Plant Shutdowns and Curtailments

If plant or process shutdown and curtailment are eligible sources of ERCs, they may represent the easiest and cheapest supply of ERCs. The industrial base of most cities, such as Louisville, is constantly shifting as older industries are replaced. Firms shutting down a facility will often be quite willing to divest themselves of ERCs in order to raise capital for modernization of its plant. In Louisville, the APCD has already identified a number of shutdowns that have produced ERCs which could be banked. These shutdowns are listed in Table 6. A 09 code in the compliance status field of the EIS/P&R system indicates a shutdown. By keying on this code, the system can cull the shutdowns from the inventory and produce a printout showing just those sources. Thus, using this method, brokers can be easily and quickly identified.

Short of a total shutdown, firms may be able to create ERCs by curtailing operations. Ford Motor Company, in Louisville, created a substantial amount of ERCs by reducing their operations to one shift rather than two. To create an ERC from a curtailment, sources will have to impose permit limitations on their operating hours. Brokers can assist their clients in documenting previous hours of operation (i.e., to establish the baseline) and in developing an acceptable and enforceable compliance plan that allows the air agency to determine its future level of production.

Identifying ERCs from Additional Controls

The next step is to quantify ERCs that may be created by installing more efficient air pollution control devices. Most major sources in nonattainment areas are already using reasonably available control technology (RACT). Generally, it would be quite expensive sources to use more efficient controls such as best available control technology (BACT) or lowest achievable emission rate (LAER) technology. BACT is defined as

TABLE 6

POTENTIALLY BANKABLE EMISSIONS SUMMARY

Company Name	I.D. No.	Allowable Emissions (tpy) TSP	Allowable Emissions (tpy) SO_2	Actual Emissions (tpy) TSP	Actual Emissions (tpy) SO_2	Actual Emissions (tpy) THC
Harshaw	86	4	0	0	0	0
Jefferson Concrete	100[a]	268	0	0.5	0	0.3
Jefferson Concrete	252[a]	184	0	1.5	0	0
Precision Metals	177[a]	14	2	1.0	1.7	0
NST Metals	755[a]	--	--	0	0	0.2
Peerless Manufacturing	--	--	--	--	--	82.6
Cohart Refractories	50	5	--	3.1	0	0
Monitor Cabinets	154[a]	--	--	2.0	0	0
Philip Morris	171	169	557	5.3	55.5	0.6
International Harvester Foundry	97	352.5+	--	925.0	--	--
Logan Company	118	4	--	2.9	0	0
Louisville Cooperage Plant #3	123	14	--	3.8	0	0
Miller's Concrete	218[a]	58	4	1.1	0.3	0
Flexible Materials, Plant #2	229	7	8	0.2	0.1	0.6
National Distillery Hill & Hill	158	149	417	10.0	40.0	--
Henry Bickel	24[a]	47	--	2.8	0	0.1
Campbell Tobacco	35[a]	15	101	14.7	52.1	3.4
Murphy Manufacturing Co.	763[a]	5	--	1.0	0	6.7
Old Boone Distillery	166[a]	40	104	0.2	1.0	256.0
Texaco, Inc.	222	--	--	0	0	3.6
Kentucky Concrete Pipe	107[a]	90	7	<0.1	neg.	neg.
Tube Turner	227	9	--	2.0	0	19.0

[a] Complete shutdown with company gone out of business or out of county.

the most efficient control equipment technically and economically feasible for new major sources seeking to construct in PSD areas. LAER is defined as the most stringent emission limitation in any SIP or achieved in practice by a similar source. LAER must be achieved by new major sources locating or expanding in nonattainment areas. Cases where sources may install more efficient controls than RACT include the following:

- Retrofit of BACT or LAER on major sources.
- Change in production processes to reduce emission.
- Additional control of smaller sources.
- Fuel switch or change in other inputs.

It is difficult to specify techniques for identifying such cases because the decision as to whether the creation of ERCs through installation of further controls must be made on a case by case basis.

The CAA requires that states impose RACT on all sources that have a significant impact upon air quality in a nonattainment area. A significant air quality impact has been defined by EPA as 1 $\mu g/m^3$ annnual average, 5 $\mu g/m^3$ 24-hour average, or 25 $\mu g/m^3$ 3-hour average concentration for particulate and sulfur dioxide as determined through air quality dispersion modeling. States have defined RACT differently in the 1979 SIPs. For VOC sources, EPA issued Control Technology Guidelines (CTGs) for specific categories of sources. The states used these CTGs to write regulations defining RACT although variances may have been granted for specific categories based on economic considerations. For other pollutants, RACT in some EPA regions was determined on a case-by-case basis. In other cases, the existing regulations were reviewed to determine their stringency. In any case, the emissions limitations imposed in a SIP approved by EPA consistute RACT for all of the sources in the area.

EPA determines LAER and BACT on a case-by-case basis during the new source review process. EPA has, however, established a clearinghouse which publishes a compendium of BACT/LAER determinations. The brokers will want to consult this publication in order to compare RACT as defined for the sources in his or her market area with these different technologies. In some cases, the cost differential between RACT and BACT or LAER may not be great. The DuPont synthetic fibers plant in Waynesboro, Virginia, for example, chose to use baghouses on its coal-fired boilers rather than electrostatic precipitators (ESPs) because the company estimated that the cost of baghouses and ESPs were comparable and felt that baghouses would be a more reliable control technology for this particular application. Baghouses are generally recognized as BACT and LAER technology for coal-fired industrial boilers. As a result of the installation of the baghouses, ERCs were created. If a source is not currently using RACT but may be required to do so by 1987, it may be cheaper for the source to install BACT or LAER technology and create ERCs for trading. To quantify the potential for such ERCs, the inventory should be reviewed to identify sources that will have to install RACT and compare the cost differential between RACT and BACT or LAER.

Smaller sources in the area may be using inefficient control equipment that may be accepted as RACT. For example, woodworking plants commonly use cyclones. Instead baghouses might be used to control these sources without a large expenditure of money. Candidate sources of this type can be identified in the emission inventory by reviewing the computer codes for control equipment. Cyclones in the inventory are generally coded as high, medium, or low efficiency. The Guide for Compiling a Comprehensive Emission Inventory (EPA Publication No. APTD-1135) contains basic guidelines for the use of the NEDS system. Many of the codes in APTD-1135 are also used in EIS/P&R and other inventory systems used by states. Table 7 lists the codes for control equipment. The inventories will also indicate the control efficiency used on individual processes. In some cases, sources employing control equipment such as ESPs, which may be capable of achieving high efficiencies, may not be attaining the maximum reduction possible. The broker should be able to identify such sources which might be controlled more effectively by reviewing both the control equipment codes and control efficiencies.

The emissions inventory should also be examined to identify sources achieving a higher efficiency with their control equipment than is necessary to meet the requirements of the SIP. For example, sulfur dioxide emissions from Louisville Gas and Electric Company's coal-fired power plants are limited by the SIP to 1.2 lb/million Btu. Recent stack tests indicate that the company's emissions are actually ranging between 0.6 and 0.9 lb/million Btu. If the utility was willing to accept permit conditions limiting allowable emission to a level less than the current SIP limit, a sizable quantity of ERCs would be created. The emissions inventory could be used to identify possible cases where actual emissions are less than allowable because of better performance of control equipment than expected. To make this initial determination, brokers should examine the emissions inventory to identify the method used to calculate the actual emission rate for particular sources. The EIS/P&R system has codes to indicate whether actual emission rates are based on emission factors or stack test data. Data for sources that have lower actual emissions than allowed could be reviewed to determine if the data are based on source tests and therefore represent a likely source of ERCs. The local agency would also be a valuable source of information for identifying this type of ERC supply.

Another method of creating ERCs is process modifications. Sometimes, it is more cost effective to control air pollution by modifying the process rather than installing control equipment. VOC emissions from surface coating operations can often be controlled effectively by converting to water based coatings. ERC creation from process modification is difficult to determine without detailed knowledge of the process. Normally, process modification as a control technique would be limited to VOC sources. EPA has published control technology guidelines for certain VOC source categories. Some of these source categories can be controlled by process modification and, thus are likely candidates for the inexpensive creation of ERCs.

Improvements in control technology occur every year. Brokers should be in the forefront of control technology innovation because these improvements often represent a low cost means of creating ERCs. EPA is a valuable

TABLE 7

CONTROL EQUIPMENT IDENTIFICATION CODES

Identification Number	Control Device/Method
000	No Equipment
001	Wet Scrubber - High Efficiency
002	Wet Scrubber - Medium Efficiency
003	Wet Scrubber - Low Efficiency
004	Gravity Collector - High Efficiency
005	Gravity Collector - Medium Efficiency
006	Gravity Collector - Low Efficiency
007	Centrifugal Collector - High Efficiency
008	Centrifugal Collector - Medium Efficiency
009	Centrifugal Collector - Low Efficiency
010	Electrostatic Precipitator - High Efficiency
011	Electrostatic Precipitator - Medium Efficiency
012	Electrostatic Precipitator - Low Efficiency
013	Gas Scrubber (general, not classified)
014	Mist Eliminator - High Velocity
015	Mist Eliminator - Low Velocity
016	Fabric Filter - High Temperature
017	Fabric Filter - Medium Temperature
018	Fabric Filter - Low Temperature
019	Catalytic Afterburner
020	Catalytic Afterburner with Heat Exchanger
021	Direct Flame Afterburner
022	Direct Flame Afterburner with Heat Exchanger
023	Flaring
039	Catalytic Oxidation - Flue Gas Desulfurization
040	Alkalized Alumina
041	Dry Limestone Injection
042	Wet Limestone Injection
043	Sulfuric Acid Plant - Contact Process
044	Sulfuric Acid Plant - Double Contact Process
045	Sulfur Plant
046	Process Change
047	Vapor Recovery System (including condensers, hooding, and other enclosures)
048	Activated Carbon Adsorption
049	Liquid Filtration System
050	Packed-Gas Absorption Column
051	Tray-Type Gas Absorption Column

NOTE: These code numbers are used in the NEDS and EIS/P&R computerized emissions inventory data handling systems to identify the type of devices/methods used to control emissions from each source.

source of information on control technology developments. For example, EPA publishes a summary of industrial boiler applications of flue gas desulfurization. Another series of publications addresses control technology developments in specific industries such as the metallurgical industry. Most EPA publications dealing specifically with control technologies are published by EPA's Industrial Environmental Research Laboratories. EPA publications are readily available from EPA, the Government Printing Office, and the National Technical Information Service (NTIS). NTIS publishes a Quarterly Abstract Bulletin of EPA publications. Private sources of information include individual vendors, the Air Pollution Control Association (APCA), and the Industrial Gas Cleaning Institute. Most of the major vendors usually exhibit at APCA's annual meetings. APCA also sponsors a number of specialty conferences each year. The Journal of the APCA publishes articles periodically on innovations in control equipment. Informing clients of new technologies and expanded applications of existing eqiupment in an important service brokers can provide.

As part of the market analysis in Louisville, particulate sources with emissions greater than 40 tons/year were examined. Emissions from utilities were not included in the analysis. The analysis was limited to these sources for the following reasons:

- Time savings in the analysis can be achieved by limiting the number of sources on the inventory that is examined. A 40 ton/year limit would catch most major sources likely to supply ERCs.

- Most of the large industrial boilers which would be controlled by baghouses would be included. Since the cost differential between baghouses and ESPs for industrial boilers is marginal and baghouses can routinely achieve a greater efficiency, these sources are likely ERC creators.

- Utility boilers would be far more expensive to control and because of size considerations are more likely to be controlled better already.

- Sources included in the analysis account for 16% of the total point source emissions in Jefferson County. Utility boiler emissions constitute 41% of this total.

- ERC creation from smaller sources may be more difficult.

- Sources in this size range are more likely to take advantage of controlled trading options. In fact, some of these sources have already created ERCs which have been entered in the registry. Thus, they area already familiar with the program.

Thus, an initial analysis of these sources can provide a useful measure of ERC supply for particulates in Louisville.

The supply of particulate ERCs from these sources would be limited because the weighted average control efficiency is 98.3%. It was possible however to identify a few sources which might be more effectively controlled to produce ERCs. Table 8 shows the results of this analysis. LAER technology and control efficiencies indicated in Table 8 are based upon a comparison of ths control technology and efficiency needed by the sources (as stated on the inventory) and that technology and efficiency that has been applied to similar sources or categories of sources. Note, however, that such technology may not be applicable to the specific sources in Louisville, but is indicative of the type of controls that could be potentially applied to produce ERCs. Controlling these sources further is likely to be quite expensive because centrifugal collectors or low efficiency wet scrubbers would be replaced by baghouses or electrostatic precipitators. Thus, this analysis only provides the boiler with a first cut at estimating the potential ERC supply.

Conducting an Emission Reduction Audit

One particularly important service brokers could provide for their clients is to analyze their control strategies to determine the costs and feasibility of producing ERCs. As part of their marketing efforts, brokers will want to assist firms in conducting emission reduction audits. Such an audit would consist, in general, of the following steps:

- Review control technology. The auditor would consider whether more efficient control equipment or techniques are available for processes within the plant.
- Estimate costs for alternative controls. Cost is an important consideration in deciding whether to install more efficient control equipment. Engineering cost analyses would be a major effort in the audit.
- Determine availability and costs of financing. Brokers can assist firms in raising the necessary capital and in analyzing whether this use of its funds satisfies the firms investment hurdle.
- Analyze internal bubble opportunities. In addition to creating ERCs for external trading, the audit should identify opportunities for the source to bubble its sources internally.

To firmly establish the ERC supply, the broker must improve the information available by working with potential suppliers to obtain the results of emission reduction audits.

Emission reduction audits are, in fact, one of the most useful services that brokers can perform their clients. They are particularly useful to sources who must install additional controls to meet RACT requirements, are undergoing a shift in production lines, are modifying or expanding, or are undergoing other physical or product alterations. During the market analysis, the broker should identify firms that might benefit from an audit and promote this service to these clients. In addition to increasing the supply of marketable ERCs, the brokers should be able to profit by identifying specific measures that the client can undertake that will yield significant cost savings.

TABLE 8

POTENTIAL SOURCES OF PARTICULATE ERCs IN LOUISVILLE

	Existing Conditions			Possible Application of LAER		
	Actual Emissions (tons/year)	Efficiency (percent)	Process	LAER Efficiency (percent)	LAER Emissions (tons/year)	Possible ERCs Created (tons/year)
B. F. Goodrich	78.6	Uncontrolled	Coal Boiler	99.9	< 0.1	78.5
Ralston Purina	76.5	Uncontrolled	Grain Transfer	99.9	< 0.1	76.4
Airco Carbide	74.2	Uncontrolled	Carbide Production	--	--	--
International Harvester	82.6	73	Coal Boiler	99.9	0.3	82.3
	48.6	75	Gray Iron Molding	--	--	--
B. F. Goodrich	86.6	86.7	Coal Boiler	99.9	0.7	85.9
Department of Sanitation	477.0	90	Incinerator	99.0	47.7	429.3
Stauffer Chemical Co.	45.5	90	Coal Boiler	99.9	0.5	45.0
Ford Motor Co.	63.4	92	Coal Boiler	99.9	0.8	62.6
E. I. DuPont	268.7	93	Coal Boiler	99.9	3.8	264.9
Rohn & Haas	115.7	97.5	Coal Boiler	99.9	4.6	111.1
	84.3	97.5	Coal Boiler	99.9	3.4	80.9
	78.3	97.5	Coal Boiler	99.9	3.1	75.2
American Standard Iron Foundry	75.0	98	Herm Sand	--	--	--
E. I. DuPont	76.6	98	Coal Boiler	99.9	3.8	72.9
Ashland Oil	92.5	99.9	Oil Cracking	99.9	92.5	0
TOTAL	1824.0				161.0	1465.0

Other Potential Sources for Creating ERCs

The last step in assessing ERC supply is to consider the potential for obtaining ERCs from small point sources, area sources, and mobile sources. These sources are likely to emit significant quantities of pollution in many areas. For example, mobile sources are generally the predominate sources of VOC emissions.

There are a number of problems in trying to create ERCs from these sources. Emissions from these sources are very difficult to quantify and would be difficult to certify as permanent. Ownership of ERCs from these sources might also be questionable. As a result of these problems, care must be taken in trying to develop ERCs from these sources.

Industrial process fugitive emission and open dust sources are other potential sources of ERCs. Fugitive emissions are those emissions from industrial processes like rock crushers, coke oven door leaks, and so forth, that are not emitted from stacks but are emitted to the open air. Open dust emissions sources include material storage piles, reentrained dust from paved roads, unpaved roads, and so forth. Open dust and fugitive sources have not normally been well controlled in the past and, therefore, these emissions may be quite large and often have a significant impact upon air quality near a facility. In those situations where these emissions can be effectively controlled by a firm, they offer a potential source of particulate ERCs. The use of these ERCs may be limited, however, because the air quality impact of a like quantity of ERCs from fugitive emissions and those from sources with stacks would differ markedly because of differing dispersion characteristics. Moreover, controls on open dust and from roadways have frequently been included by states in the design of their attainment strategy and therefore may not always qualify for credit.

ANALYSIS OF DEMAND FOR ERCs

Even though there may be an abundant supply of a commodity, there can be no market for that commodity unless there is a demand. Demand and supply, however, are dynamic processes rather than static and finite givens. Brokers should not only try to estimate existing demand, but should pursue aggressive marketing activities to create the demand. This is a new market and brokers must convince firms that significant cost savings can be realized through the use of ERCs to satisfy permit requirements.

Estimating Existing Demand

The following tasks, described below in more detail, will provide a useful measure of ERC demand:

- Examine local regulations to identify limits on ERC use. In addition to the ERC banking regulations, rules governing offsets for new source emissions, EPA's bubble policy, and PSD must be reviewed. ERC demand will be dependent upon how ERCs can be used to meet these control requirements.

- Identify the potential for bubble policy applications. A major use of ERCs will be for bubbles. The bubble policy offers an opportunity for existing sources to exercise greater flexibility in reducing their costs of meeting emissions limitations.

- Project expansion of existing industry. Most ERCs used in Louisville, to date, have been used to offset emissions when firms modernize or expand existing facilities.

- Identify areas and types of new growth. Although new growth in nonattainment areas will be emphasized, controlled trading can also be used in PSD areas.

- Locate areas of demand and consider area specific supply. Particulate and sulfur dioxide ERCs in a specific location may not be used to meet demand in another area because no air quality benefit would result.

Examine Local Regulations to Determine Potential Uses of ERCs

The extent to which ERCs can be used for controlled trading depends upon local regulations. These regulations establish the limitations on the use of ERCs to:

- Offset increased emissions in nonattainment areas.

- Meet current and future more stringent regulations through the use of bubble policy.

- Avoid consuming or violating increments in areas subject to PSD regulations.

Emission Offsets

A major use of ERCs is to offset increased emissions from expansion of existing or new plants. Most major metropolitan areas throughout the country are designated nonattainment for one or more pollutants. Jefferson County is a nonattainment area for TSP, sulfur dioxide, ozone, and carbon monoxide. Since the Kentucky SIP, like most SIPs, does not require emissions reductions more than necessary to attain the standards in order to accommodate growth, any new or modified major sources of these pollutants will have to obtain offsets. Louisville regulations define major sources and major modifications as those with potential emissions more than 100 tons/year at continuous operation without control equipment or actual emissions more than 50 tons/year with control equipment at continuous operation. These threshold limits are important because they define the threshold used to determine whether the new or modified sources will need to offset emissions. To date, all of the ERCs withdrawn from the bank in Louisville have been used to offset expansions of existing plants.

Bubble Policy Applications

Another major use of ERCs is to reduce the cost of controlling existing sources subject to stringent emissions limitations by applying

EPA's bubble policy. In general, the bubble policy states that a source can selectively control processes within a facility as long as the overall emissions limitation for the facility as a whole is met. Thus, it is as if a bubble were placed over the facility and consideration given only to the impact of the emissions from the facility outside the bubble and not to air quality directly within the bubble. Although commonly thought of as involving only emissions points within a single facility, the policy allows emissions points from more than one facility to be included in the bubble. This policy is a keystone of EPA's regulatory reform program because it provides industry an opportunity for greater flexibility in meeting regulatory requirements.

Normally, a bubble must be approved as a SIP revision. Recently, EPA has approved New Jersey's generic bubble for VOC sources which requires only state issued permit limitations. The generic bubble rule substantially reduces the time required for approval. New Jersey has estimated that the generic rule will greatly increase the number of bubble policy applications. Louisville does not have a bubble regulation at all. Thus, any bubble proposed in Louisville would have to be subject to negotiation with the local agency and approved by EPA as a SIP revision. The Commonwealth of Kentucky has incorporated the bubble policy into their regulations. These regulations specify, however, that a SIP revision would be required. Although Jefferson County has not adopted a bubble policy, Kentucky's regulations could provide a basis for applying the bubble policy in the County.

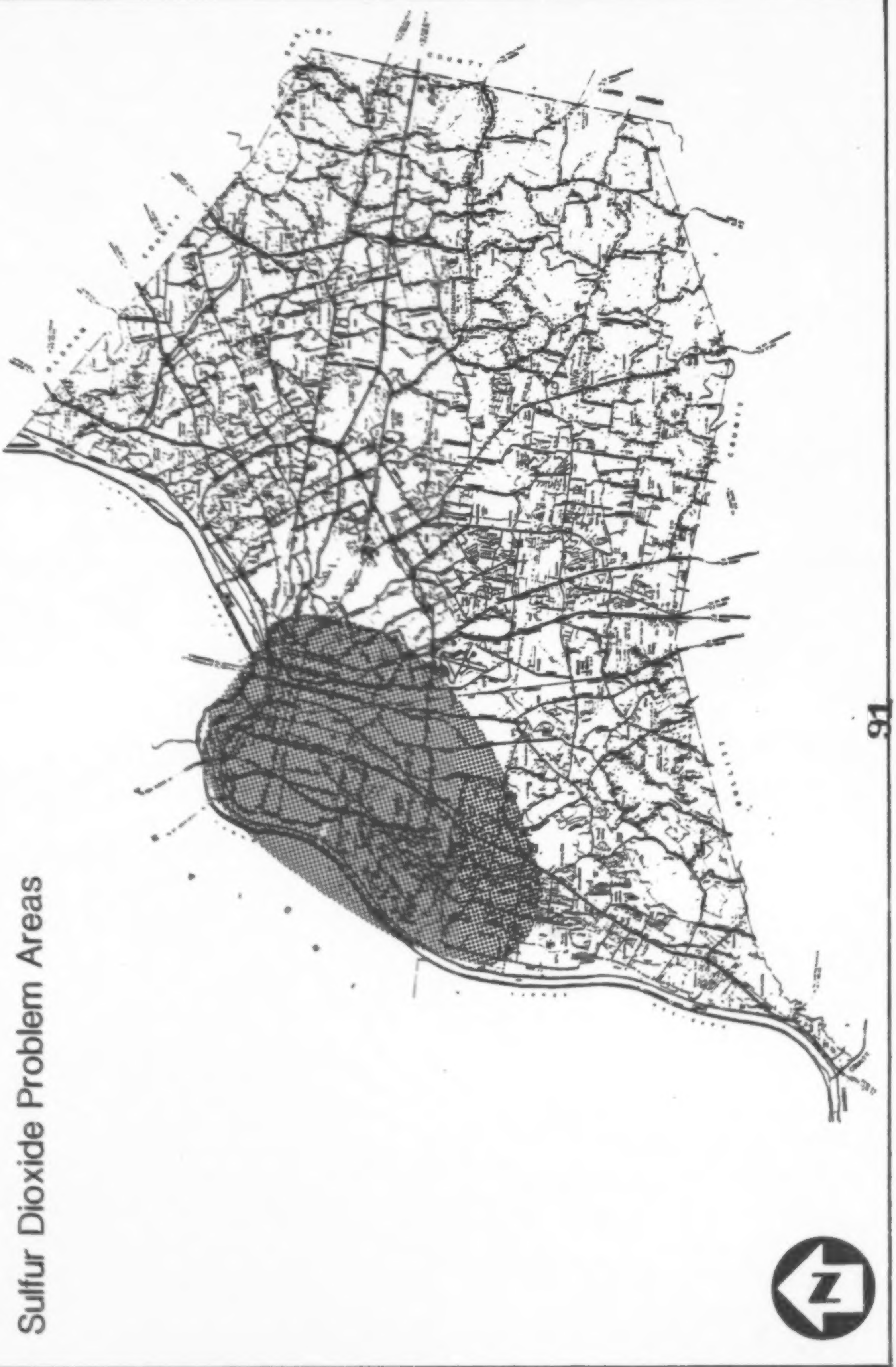
Avoidance of PSD Increment Consumption

The PSD regulations specify maximum air quality increments which cannot be exceeded by a new major source locating in an area where present air quality is better than the NAAQS. There are two cases in which a source might be prevented from constructing in a PSD area. In the first case, other sources that were constructed in the area earlier may have consumed all of the available air quality increment. SIP revisions which loosen emission limitations for existing sources also consume PSD increments. The other case is where the existing air quality, although better than NAAQS, is not sufficiently better than the standards to allow consumption of the PSD increment without violating NAAQS. A source is never allowed to violate NAAQS even though its impact may be less than the PSD increments. In each of the cases, ERCs could be used by firms to avoid creating a PSD violation by offsetting emissions from a proposed new facility.

The Jefferson County APCD designate the entire County as a nonattainment area although air quality in the rural portion of the County is better than the NAAQS. Maps showing areas of Jefferson County where severe air pollution problems exist are included in the County's comprehensive plan. Figure 4 shows problem areas for sulfur dioxide. Although the APCD has indicated that new sources applying for permits will be reviewed on a case-by-case basis, because of this nonattainment designation, use of ERCs to increase PSD increment in the Louisville area will be limited at least until 1987 when all NAAQS, including secondary standards, are due to be attained.

FIGURE 4

Sulfur Dioxide Problem Areas



Potential Bubble Policy Applications

To estimate demand for ERCs, brokers will want to consider separately the potential for use of ERCs in each of its regulatory contexts. The first step is to identify the potential applications of the bubble policy. This step can be accomplished by reviewing the emissions inventory and regulations to identify the following types of sources likely to bubble:

- Sources that must meet new emissions limitations as a result of recent SIP revisions requiring more stringent controls.
- Facilities with a multitude of individual processes with widely varying marginal control costs.
- Sources currently burning oil that may convert to coal or natural gas.
- Two or more sources in close proximity or under common ownership that may find it more cost-effective to enter into a bubble because of varying costs of control.

Brokers can quickly identify firms that may benefit from applying the bubble policy by reviewing the SIP, which will normally list specific sources or source categories that must implement further controls. Each SIP must also have a section discussing the economic, energy, and social effects of new regulations. In most areas, new regulations requiring more stringent emissions controls apply to sources of VOC. The Kentucky SIP identifies the specific categories of VOC sources for which new emissions limits were established in 1979. This list is given in Table 9. Kentucky based these regulations generally upon the Control Technology Guidelines (CTGs) issued by EPA. The Kentucky SIP also identifies the following impacts for each VOC source category:

- Cost of control per ton of reduction.
- Energy demand.
- Problem areas in implementing the regulations.

This information from the Kentucky SIP is given in Tables 10 and 11. Major elements of the Louisville economy, such as automobile assembly and large appliance coating, will be affected. The automobile assembly and large appliance coating industries in Louisville are good examples of potential users of the bubble policy for the following reasons:

- Each industry emits large amounts of VOCs that are presently uncontrolled, but are required by the 1979 SIP to be controlled at RACT levels.
- There are only a few sources in each category. These sources, Ford and General Electric, are very large and have a multitude of individual emission points.

TABLE 9

VOC SOURCES REQUIRED TO INSTALL RACT BY 1979 KENTUCKY SIP

1. Asphalt Paving (401 KAR 63:025)
2. Solvent Metal Cleaning (401 KAR 61:095)
3. Large Appliance Surface Coating (401 KAR 61:110)
4. Metal Furniture Coating (401 KAR 61:105)
5. Automobile and Light Truck Surface Coating (401 KAR 61:090)
6. Service Stations (transport unloading into storage tanks, Stage I, 401 KAR 61:085)
7. Petroleum Liquid Storage (401 KAR 61:050)
8. Petroleum Liquid Loading, Terminals and Bulk Plants (401 KAR 61:055 and 401 KAR 61:056)
9. Magnet Wire Coating Operations (401 KAR 61:100)
10. Sources Using Organic Solvents (401 KAR 61:060)
11. Fabric, Vinyl, and Paper Surface Coating (401 KAR 61:120)
12. Can Coating (401 KAR 61:125)
13. Coil Coating (401 KAR 61:130)
14. Petroleum Refining, Miscellaneous Sources (401 KAR 61:135)
15. Dry Cleaning (Local Agency Regulation)

Kentucky Administrative Regulations (KAR).

TABLE 10

RACT CONTROL COSTS FOR VOC SOURCE CATEGORIES

RACT Category	Cost Per Ton of Reduction	Energy Demand[a]
Paper Coating	$ 520-680	+12,900
Automobile Assembly	$1,550-2,660	+87,000[b]
Metal Furniture Coating	$ 126	-1,300
Large Appliance Coating	$ 320	-5,120
Solvent Degreasing	$ 105	+300
Refinery Vacuum Systems	$ 5	-48,600
Gasoline Terminals	$ 188	-33,750
Gasoline Bulk Plants	$ 300	-1,500
Storage Tanks	$ 256	-16,000
Service Stations	$ 95	-9,500
Cutback Asphalt	$ 17[c]	-1,800

[a] Equivalent barrels of oil, positive (+) means additional energy required, negative (-) indicates savings.

[b] 87,000 if CTG strictly adhered to, deviation from CTG may be less but is technology dependent.

[c] First year cost, no cost in following years.

TABLE 11

PROBLEM AREAS IDENTIFIED IN APPLYING RACT TO VOC SOURCES

RACT Category	Problem Area
Paper Coating	Wide variation in type and cost of control
Automobile Assembly	Technological limitations on topcoat formulations
Metal Furniture Coating	Quality control of various colors
Large Appliance Coating	High solids technology unproven commercially
Solvent Degreasing	None
Refinery Vacuum Systems	None
Gasoline Terminals	Requires coordination throughout marketing system
Bulk Plants	Severe economic impact on small operations
Storage Tanks	Availability of equipment
Service Stations	Older stations have higher retrofit costs, also dislocation during installation is a concern
Cutback Asphalt	Cold weather application, storage time limits

- o There is a wide difference in the cost of RACT. The Kentucky SIP estimates that the average cost per ton of VOC emission reduction from large appliance industry is $320 and that for the automobile assembly ranges between $1550 to $2660/ton.
- o Each of the two major firms affected by these requirements has ERCs in the registry.

Thus, a broker in Louisville might initially target any marketing efforts toward demonstrating the potential cost savings through use of a bubble to meet these recently imposed RACT requirements.

A broker in Louisville might focus in Ford's and General Electric's facilities and identify specifically how they might save money by using the bubble to satisfy VOC requirements. Table 12 shows a summary of RACT and LAER costs and levels of control for these VOC categories. The emission reductions indicated for each plant are based on earlier reviews by ES of the control technology to achieve both RACT and LAER. Both companies have VOCs in the registry. Ford has 343 tons/year, and General Electric has 70 tons/year. Ford could possibly meet its RACT requirements (i.e., 1084 tons/year) with the following methods and costs:

- o Use the 343 tons/year in the ERC registry at no direct cost.
- o Purchase the 70 tons/year of ERCs from General Electric at half the cost Ford would incur to control a ton, but at twice the costs General Electric would incur to further reduce its emissions. The total price would be $54,250.
- o Pay General Electric $775/ton to generate the 322 tons/year of ERCs that could be obtained if General Electric controlled at LAER levels rather than RACT. The total cost to Ford would be $249,550.

Ford would have only 349 tons/year of emissions reductions to obtain from its own plants at a total cost of $734,645. Ford could realize a savings of $1.3 million. General Electric would save $300,000 or 3/4 of the cost of implementing RACT by selling its excess ERCs to Ford. This analysis should not be considered definitive because many assumptions underly it, but it is illustrative of the kind of analysis and bubble policy scenarios that a broker can undertake to promote controlled trading to clients.

Other bubble candidates will be more difficult to identify. Fuel conversion bubbles are now particularly likely with the increased availability of natural gas. Some brokers might want to specialize in this particular type of bubble policy application. Applications of the bubble for sources that have a multitude of processes with varying marginal costs could not be readily identified by the broker without a thorough understanding of control technologies and costs. Similarly, whether two or more sources could combine in a bubble would be based on internal cost considerations of each facility to which a broker would generally not be privy. Brokers will want to work with their clients to carefully evaluate these bubble possibilities.

TABLE 12

CONSIDERATION OF CONTROL OPPORTUNITIES IN THE LARGE APPLIANCE AND AUTOMOBILE ASSEMBLY INDUSTRIES IN LOUISVILLE

Plant	Uncontrolled Emissions	Alternative Control Levels		Alternative Control Costs	
		RACT Emissions[a]	LAER Emissions[a]	RACT ($ Million)	LAER ($ Million)
General Electric Co.	1825	458	136	0.44	0.54
Ford Motor Co. Assembly Plant	1295	211	63	2.28[b]	2.59[b]
TOTAL	3120	669	199	2.72	3.13

[a] Based upon general analyses of control technologies performed by Engineering-Science in 1978-79.

[b] Assume $2105 which is the midpoint of the range of control costs given in the SIP.

Expansion of Existing Industry

The second major element in ERC demand is the requirement to offset emissions from new or expanding sources locating in a nonattainment area. In order to estimate ERC demand from this requirement, industrial growth projections are needed. This methodology can be based on general employment trends for the region. The first step is to determine the emissions per employee for each 2-digit SIC category. Emissions in the inventory can be grouped according to 2-digit SIC and divided by the number of employees in the particular SIC. Although emissions per employee can vary widely between plants within the SIC, the number of employees is generally a good estimate of the magnitude of a sources emissions. The inventory must first be corrected to reflect LAER emission rates. LAER emission rates can be determined on the basis of individual Standard Classification Codes (SCCs) based upon generally available data from the BACT/LAER clearinghouse. It is necessary to use LAER emission rates because sources expanding in a nonattainment area must use LAER technology. With the emissions per employee per 2-digit SIC and projected growth in employment, the ERC demand can be estimated.

The technique outlined above can be illustrated using the VOC emission inventory for Louisville. Table 13 is a summary of the uncontrolled, actual, and LAER emission rates for each 2-digit SIC. The growth rate in emissions is also shown in the table along with the emissions that must be offset. To limit this analysis to a manageable size, this analysis only considers sources with actual emissions greater than 40 tons/year. Even if smaller sources expand, they are not likely to increase emissions sufficient to trigger new source review, and therefore would not have to obtain offsets. Negative growth rates were not used in this analysis because declining industries would normally be expected to generate ERCs rather than consume them.

Identifying Sources Likely to Locate in an Area

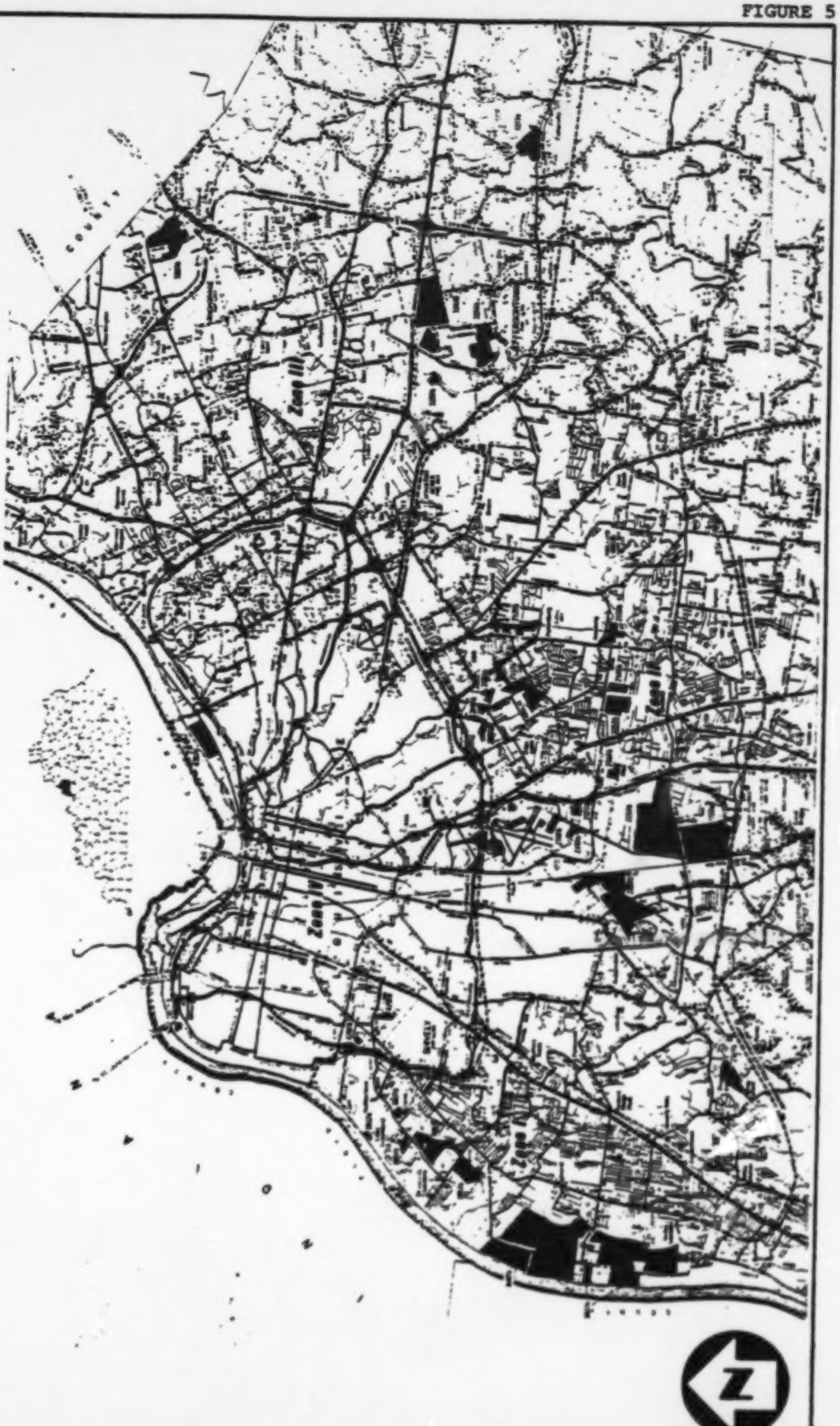
The next step is to identify new industrial growth that may require ERCs for offsets. The Louisville Chamber of Commerce had some very useful information for this purpose. One type of information was the location of sites that had already been zoned for industry. A map of these sites is shown in Figure 5. In Louisville, there are two major industrial parks that are being developed. Riverport is located along the Ohio River south of LG&E's Cane Run Power Plant. The Riverport Development Authority was contacted in order to identify the type of industry that might be locating there. A significant portion of development in Riverport will probably be warehousing and light assembly because the Authority has established a Foreign Trade Zone. The other area, Station Park, is near downtown Louisville and is part of the urban renewal effort. Only warehousing and light industry is planned for this area. Thus, ERCs are not likely to be needed to offset development in Station Park and part of Riverport. Other industrially zoned areas are owned by existing industry and may be used at least in part for their own expansion. Each area where industrial development may occur should be analyzed. The broker should assume a proportion that may be given to grassroots industry. For example, assume that 50% of Riverport will be developed by grassroots industry requiring offsets. The LAER emissions determined above can then be divided

TABLE 13

PROJECTED EMISSIONS REQUIRING OFFSETS BY 1985

SIC #	SIC Name	Uncontrolled Emissions (tpy)	Actual Emissions (tpy)	LAER Emissions (tpy)	Growth Rate (Percent)	Additional Emissions That Must Be Offset (tpy)
25	Furniture & Fixtures Mfg.	243	243	25	+1.8	25.5
26	Paper & Allied Products Mfg.	606	606	61	+9.6	67.0
27	Printing & Publishing	375	107	38	-1.0	--
28	Chemicals & Allied Produts	6403	3304	119	+4.8	125.0
29	Petroleum & Coal Products	677	314	38	-3.7	--
33	Primary Metal Industries	1117	1117	38	+13.0	43.0
34	Fabricated Metal Products	1610	1610	128	+7.8	138.0
35	Non-Electrical Machinery Mfg.	615	615	67	+12.7	75.5
36	Electric & Electronic Equipment Mfg.	3205	3205	178	+30.2	232.0
37	Transportation	1384	1384	68	+42.0	96.0
						803.0

Location of Industrial Sites in Louisville



by the total acres of existing industrial usage to provide an estimate of ERCs per acre needed for industrial development. This method is based on the assumption that new industry will have the same characteristics as existing industry. This assumption is rather gross, but is reasonable given the fact that similar industries tend to aggregate in a particular area. Sectors of the local industrial base that are projected to decline can be discounted in this process.

A broker will want to identify specific firms likely to move into an area so that the firm can advertise its services by direct mail. Likely candidate's firms may emerge from conversations with development agency personnel but, normally, these people will be rather discreet concerning particular "hot leads." Instead, the broker should rely primarily on the following techniques:

- Consider the existing industry in the area. Generally if particular firms in an industry have selected an area, other firms in the same industry might also find the area attractive.

- Determine who supplies major firms in the area. Suppliers often move to be near their major clients.

- Find out from the local development agencies about firms that have made inquiries.

- Review the planning agency's growth projections to identify industrial sectors that are projected to grow.

- Develop business contacts with industrial realtors and industrial location specialists in the area.

With these techniques, the broker can identify a large number of firms that could be contacted as potential clients. The possibility of obtaining ERC brokerage services in an area could be a positive impetus for a firm to locate to a particular area.

Analysis of the Location of ERC Supply/Demand

For particulate matter and sulfur dioxide, the location of ERC supply and demand is an important consideration because dispersion characteristics will determine whether a particular ERC supply can be used to offset or bubble emissions from a source in a different location. ERCs from a plant in one end of the county may not be used to offset or in a bubble with emissions in another part of the county because these ERCs will generally not result in an air quality improvement in the area where the new emission sources will impact. EPA is currently developing guidance so that simplified modeling analyses can be used to identify whether ERCs can be applied in particular situations. This guidance will limit cases where detailed modeling is required and, therefore, make it easier to trade. But in those cases where detailed modeling analyses may be necessary the broker must recognize the importance of location in determining the adequacy of supply and demand. Brokers should locate on maps likely areas where ERCs will be needed. Existing sources in close proximity to these areas can then be reviewed to determine if the supply in these areas will be sufficient. The map in Figure 6 was prepared by the Jefferson County APCD to locate ERC suppliers that could meet demands generated by facilities locating in Riverport. It is illustrative of the type of analysis necessary for particulate and sulfur dioxide. This step will complete the demand assessment portion of the market analysis.

Steps to Generate ERC Demand

Although the methodology outlined above is an attempt to quantify supply and demand, the broker should not consider any numbers derived from these exercises as definitive. Rather, brokers should consider the market analysis to be qualitative; they can and should take a number of steps to stimulate the creation of a market. Specific actions brokers may pursue to encourage firms to buy and sell ERCs include:

- Obtain changes where necessary in local SIP regulations to facilitate the creation or use of ERCs.
- Purchase ERCs from current owners.
- Negotiate options to purchase ERCs from potential suppliers.
- Conduct an emissions reductions audit for potential producers of ERCs.
- Review firms compliance strategies to determine potential cost savings by using ERCs.
- Publicize services through direct mail and other forms of advertising.

Particularly in the early stages of market development, many firms may not be aware of the potential for profit by generating ERCs. Brokers must not only ask firms if they are interested in buying and selling ERCs, but must inform them that the possibility exists. Active, aggressive marketing is the only way to overcome the skepticism that is a natural obstacle in any new market.

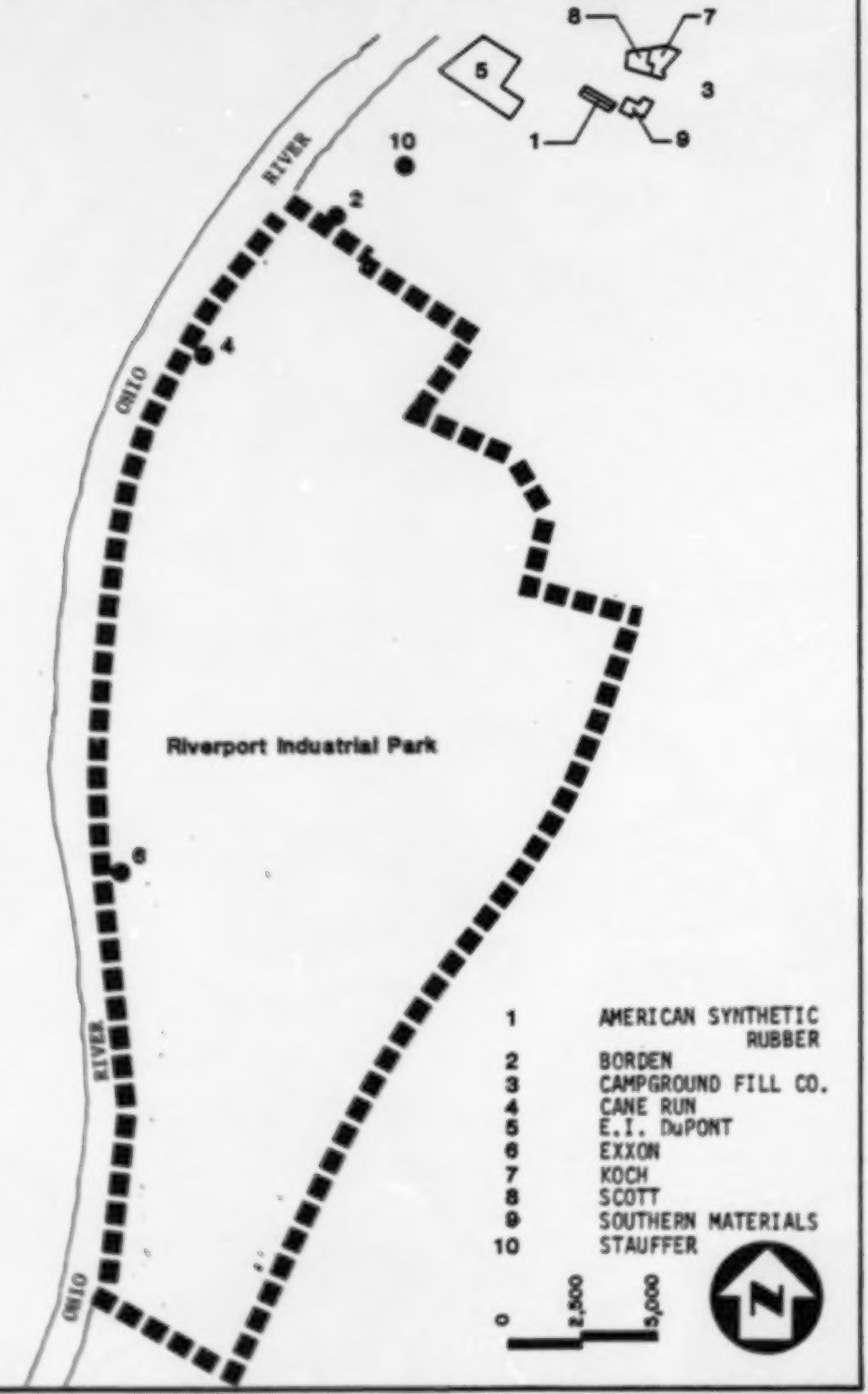
The extent to which brokers will participate in any of these efforts depends upon their role and the price of ERCs. Price and potential savings for firms will be important considerations in whether a viable ERC market can exist and whether a broker can realize a reasonable profit. The analysis of controlled trading opportunities between Ford and General Electric in Louisville, however, demonstrates that substantial savings to clients can be realized. If the broker were to ask for 10% of the savings, the commission in this case would be $160,000.

RESOURCES NEEDED FOR A MARKET ANALYSIS

Much of a market analysis like that undertaken by ES of the Louisville area, can be performed for $5,000 to $10,000. The resources that a broker may have to invest in a market analysis will depend upon the

FIGURE 6

Potential ERC Sources near Riverport Industrial Park


OHIO RIVER
Riverport Industrial Park
1 AMERICAN SYNTHETIC RUBBER
2 BORDEN
3 CAMPGROUND FILL CO.
4 CANE RUN
5 E.I. DuPONT
6 EXXON
7 KOCH
8 SCOTT
9 SOUTHERN MATERIALS
10 STAUFFER
0
2,500
5,000
N

level of analysis that he wishes to perform. The following elements comprise the resources needed for a market analysis:

- o Manpower will be the largest cost.
- o Specific skills are required for the type of analysis performed in Louisville, but each broker should try to trailor the analysis in accordance with his own skills.
- o Direct costs include travel expenses, material costs, telephone expenses, computer timesharing expenses, and so forth.
- o Time is money so that brokers should develop a schedule.

To provide the potential broker with information to define the resource needs for a market analysis, the Louisville analysis is used as an example.

Manpower

Approximately 250 manhours was required to complete the Louisville market analysis. The division of labor by specific categories is outlined in Table 14. Specific functions of these personnel at ES are:

- o Principal - plans and directs analysis, assigns personnel to project, and reviews performance.
- o Supervising Engineer or Scientist - gathers information, analyzes data, and directs lower level personnel.
- o Associate Engineer or Scientist - assembles and processes data, prepares summaries, and writes reports.
- o Draftsman/Technician - processes data and prepares figures.
- o Secretary/Typist - types reports, letters, etc.

Skills

Skills needed to perform a similar analysis would be the following:

- o Legal/Regulatory. The broker should be familiar with controlled trading regulations and air pollution control regulations.
- o Control Technology. To identify control technology options available for creating ERCs, the broker should be able to identify alternative levels of control that can be applied to different sources and processes. In general, this knowledge can be obtained by reviewing EPA and other publications to identify control efficiencies associated with RACT, BACT, and LAER. The broker does not have to be an engineer or be able to design control equipment. For example, a broker should know that electrostatic precipitators are LAER, but need not know exactly how an ESP works.

TABLE 14

MANPOWER REQUIREMENTS FOR MARKET ANALYSIS

Labor Category	Manhours
Principal	25
Supervising Engineer or Scientist	70
Associate Engineer or Scientist	110
Draftsman/Technician	25
Secretary/Typist	20
Total	250

- Financial/Control Cost Estimation. The broker must be aware of the costs associated with controlling sources and processes at different control levels. This information can also be obtained from EPA and other publications.

- Emissions Inventory. Since most of the information used in the analysis will be from the emissions inventory, the broker must be familiar with inventory systems and data, especially NEDS and EIS/P&R.

These skills should not be taken as limitations on who can become a broker. There are many potentially profitable roles for brokers in the controlled trading process. Brokers without the specific skills identified above can easily develop sufficient expertise. Moreover, the Louisville market analysis focused primarily on control aspects of creating and using ERCs. Brokers could, however, be more highly specialized. For example, a broker with tax or legal skills could handle only the financing or sales agreements.

Other Direct Costs

The major other direct costs for the analysis may be travel expenses if the broker is not located in the area that he is analyzing. Other costs include printing, telephone, materials and supplies, computer timesharing, etc. Estimates of other direct costs for the Louisville analysis are given in Table 15. Travel expenses include two round-trip airline tickets from Washington, D.C. to Louisville and rental of a car for five days. Meals and lodging are based on a $35 per diem rate for ten days. Materials purchased include a copy of the inventory ($50) and maps, etc., from the planning agency ($10). Brokers who do not use computer systems to summarize data will have to budget for more manpower.

Time

The schedule for the Louisville analysis is shown in Figure 7. In general, a broker can perform a market analysis within one to two months. This type of schedule would allow the broker to obtain all of the information necessary and make any determinations that are useful.

SUMMARY

One of the first steps a broker will want to take before entering a market is to analyze the area. This market analysis should consist of the following steps:

- Visit the area. Gather information on the emission inventory, regulations that govern the creation and use of ERCs, SIP, new more stringent emissions limitations that are being imposed on industry, industrial growth projections, etc.

- Estimate ERC supply. ERCs can be created by plant or process shutdown or curtailment, using BACT or LAER technology rather than RACT, or modifying the process to minimize emissions.

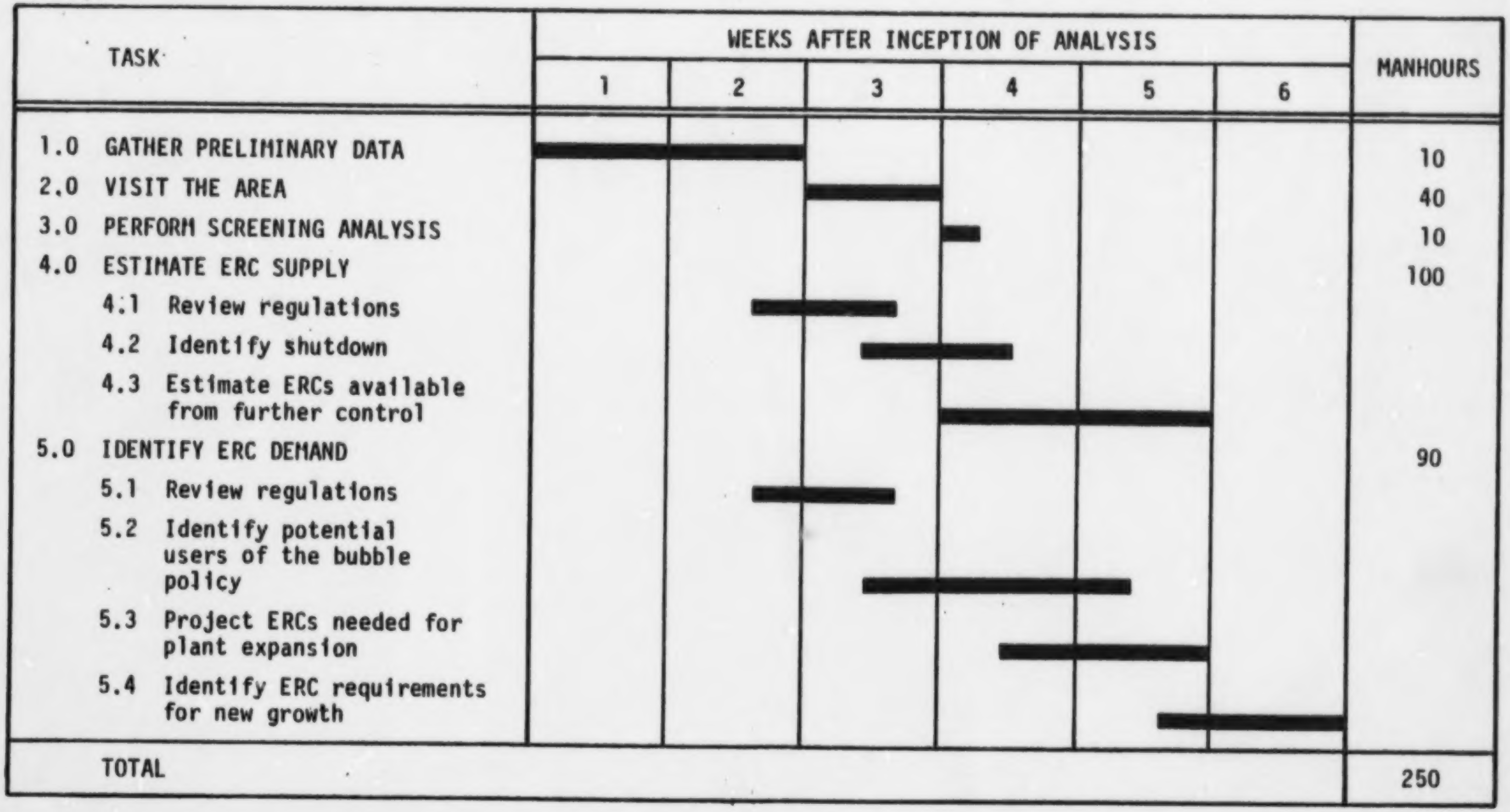
TABLE 15

ESTIMATES OF OTHER DIRECT COSTS

Category	Estimate ($)
Mileage	100
Printing	100
Telephone	100
Meals and Lodging	350
Materials and Supplies	100
Travel Expense	575
Computer Timesharing	150
Total	1,475

FIGURE 7

Schedule and Manpower Estimates for Market Analysis of Louisville



TASK	MANHOURS
1.0 GATHER PRELIMINARY DATA	10
2.0 VISIT THE AREA	40
3.0 PERFORM SCREENING ANALYSIS	10
4.0 ESTIMATE ERC SUPPLY	100
4.1 Review regulations	
4.2 Identify shutdown	
4.3 Estimate ERCs available from further control	
5.0 IDENTIFY ERC DEMAND	90
5.1 Review regulations	
5.2 Identify potential users of the bubble policy	
5.3 Project ERCs needed for plant expansion	
5.4 Identify ERC requirements for new growth	
TOTAL	250

Another source of supply for the broker is ERCs that are already in the registry.

- Identify and quantify ERC demand. ERC demand will arise from the potential uses of ERCs. ERCs can be used to offset increased emissions from expanding or new industry in nonattainment areas, to reduce the need through application of the bubble policy to install new control equipment to meet new regulations, and to avoid consuming available air quality increments or violating NAAQS in PSD areas.

The market analysis is an initial step brokers might take to help them decide whether or not to offer particular services if any in an area. This analysis will also provide important information for brokers to use in aggressively marketing their services.

There are many roles for brokers in the controlled trading program. This is a new, fast developing business in which brokers who act now have the opportunity to earn a substantial return on their investment. These returns can be achieved by buying and selling ERCs, by performing emission reduction audits, by helping clients to arrange bubbles, and by performing other related services that can save their clients considerable sums of money.

Information on financing emission reduction credits is contained under separate cover in two documents: Private Financing Manual for the Creation and Purchase of Emission Offsets and Public Financing Manual for the Creation and Purchase of Emission Offsets. Both are available from EPA at:

U.S. Environmental Protection Agency
Controlled Trading Project (PM-223)
Information Request
401 M Street, S.W.
Washington, D.C. 20460

BROKERING OPTIONS

prepared by

John S. Hoffman

Office of Planning and Evalution

EPA

for

The Brokers' Conference

January 26, 1981

Options, that is the selling of the right to buy a product within a specified time at a given price, is a method used in many industries for reducing risks both for producers and buyers. Four types of options exist in emission reduction credit (ERC) markets, reflecting various regulatory strategies in the life of an ERC. This paper describes all four types and analyzes the advantages and disadvantages of each.

The viewpoints expressed in this paper do not

necessarily represent EPA's views

Birth of a New Business Opportunity

A revolution is taking place in the way states control air pollution. Dozens of local and state air agencies have developed or are developing CONTROLLED TRADING SYSTEMS. These systems will set up markets in surplus "emission reduction credits" (ERCs): that is, reductions in pollution beyond those mandated by the State Implementation Plan. These credits can give firms discretion in how to comply with air pollution requirements. Instead of always requiring a company to meet regulatory emission limits by purchasing control equipment, controlled trading allows firms to purchase and use ERCs as long as the net effect is to comply with their obligations. Thus, under controlled trading firms will be able to produce surplus emission reductions and stand to make a profit selling ERCs. Firms with higher than average control costs will be able to reduce costs by purchasing and substituting ERCs for more expensive equipment. And firms seeking federally required new source construction permits will find it easier to purchase ERCs for use as offsets, thus maintaining air quality in the face of growth.

Cost Savings Possible With Controlled Trading Are Large and Unrealized

The cost savings of Controlled Trading are enormous. A DuPont study estimates that within its own plants over $80,000,000 could be saved by producing less expensive surplus emission reductions from some pieces of equipment as substitutes for more expensive reductions from other pieces of equipment.[1]

---

[1] This estimate is derived from an econometric model designed by M.T. Maloney and Bruce Yandle. They used data collected by M.T. Kittleman and R.B. Akell, two DuPont Company engineers. For more information see M.T. Maloney and Bruce Yandle, "Bubbles and Efficiency", in Regulation, May/June 1980, p. 49-52.

Armco Steel Company is anticipating saving between $12 and 14 million at its Middletown, Ohio facility by controlling emission points not required under the Ohio State Plan instead of ones that are presently mandated.[2]

In California a utility is seeking to buy new, less polluting production equipment for installation at some low volume emitters in order to use the resulting ERCs to offset the new emissions from a facility expansion.[3]

While numerous examples of other realized cost savings exist, only a few of the tens of thousands of sources that could potentially engage in Controlled Trading have done so. It takes time for a new market to develop. At present few firms understand or realize how to capitalize on their opportunities.

Existing Lags Represent an Enormous Opportunity For Brokers

Brokers ready to creatively overcome the obstacles now associated with controlled trading will capture those markets. A variety of different services and activities can be provided to firms to help them take advantage of cost saving and profit making opportunities. Assisting firms to develop, purchase or sell ERCs is the most straightforward service that brokers can undertake. Brokers can facilitate the legitimate trading of this commodity by assuring that the surplus reductions have been bound into an "enforceable" form by a State agency under a rule that is part of its State Implementation Plan.

---

[2] Figures are from an ARMCO presentation held June 17, 1980 at the Middletown facility. EPA regional and headquarters personnel were present along with officials from the State of Ohio.

[3] Personal communication

One major drawback, however, exists to producing and holding a fully perfected ERC. Firms are likely to incur sizeable up-front costs when undertaking control actions that produce ERCs. These costs may be very high. Holding an ERC without selling or using it also incurs costs. Risks are further increased because ERC markets are new and price information about the worth of ERCs is scarce or non-existant. Finally, as a "product", ERCs are outside the traditional product area of the firm, and are dependent on new laws. They also do not produce a physical entity with a salvage value. These attributes tend to raise many suspicions about ERC production. Many companies simply will not recognize the worth of a "piece of paper" until the market begins to pay for it. In combination with today's high interest costs, this factor makes it difficult for ERCs to compete for scarce capital which decreases the odds of investment in ERCs.

Securing large amounts of money for speculative investments will be difficult, especially if knowledgeable advocates of ERC production are unavailable to assist firms. Brokers, by being knowledgeable advocates and experts, can overcome many of these obstacles, making the brokering business attractive for those who understand its workings. Options represent a valuable tool for reducing risk, and should be considered by every broker.

Options as a Means For Reducing Risk

Options, that is the selling of the right to buy a product, within a specified time at a given price, is a method used in many industries for reducing risks both for producers and buyers.

[4]

For producers, options can serve several functions: price protection, deferral of production costs, elimination of need for up-front captial.

For buyers, options provide similar benefits. Less front end money is needed to secure ERCs, holding costs can be eliminated, and the risks of buying something unneeded can be avoided. Because of these advantages, option agreements between firms will often be easier to "sell" than ERCs. Options can play an important role in the development and penetration of many ERC markets.

Kinds of Options in ERC Markets

Four kinds of options exist in ERC markets, reflecting various regulatory stages in the life history of an ERC.

The most valuable option is a *fully perfected ERC*. A fully perfected ERC is one that the state has already approved and credited to its books, and in which the company has changed its compliance agreement, installed necessary equipment, and reduced pollution.

The second most valuable kind of option is for a *partially perfected ERC*. A partially perfected ERC is one in which a company has made a proposal which the state regulatory agency has accepted and has bound the source to the proposed compliance agreement, but in which the source has not *yet* made the actual reduction. Until the reduction is made it cannot be used nor fully protected from regulatory change.[4] Firms that agree to a compliance agreement (including a schedule of compliance) for creating an ERC can be given protection from regulatory changes for a limited period of time, but not indefinitely. The partially perfected ERC option is not as valuable as the fully perfected one because it cannot be used until the producer fulfills his control agreement.

---

[4] If a Major SIP revision is required because of a failure to achieve Reasonable Further Progress or to attain ambient standards or because of a revision in ambient standards, then the rights associated with ERCs must be adjusted according to one of several allowable methods.

A third kind of option is the fully qualified proposal with a compliance offer (by the Regulatory Authority) which the source has not bound itself to accept. Thus, a Regulatory Agency qualifies and quantifies a proposal and makes a compliance offer to the source. The source can or cannot take the offer as it sees fit. Such offers themselves can specify time limits in advance on how long they are good, but such offers must be subject to termination by the Regulatory Agency without any rights being assigned by the source. Consequently, the qualified ERC option represents a real offer for an ERC that has no guaranteed life. It is less valuable because it is subject "to being lost" if the state so declares.

A fourth kind of option is, the pre-qualified ERC. This is an option to buy the rights that would accrue if a particular action qualifies an ERC. The option would be sold before the producer actually qualifies the possible proposal with the state reviewing agency. Thus, the option's future as an ERC would be contingent on the actions by the state. No "objective" assessment of its size or characteristics would be possible.

Advantages and Disadvantages of Each Type of Option

Fully perfected ERC options guarantee buyers the right to use the ERC (or its adjusted nominal value)[5] with the time period allowed by the contract. Such options would provide total security for the buyer; he or she would know that the ERC would be there if and when he or she needs it. For sellers, such options are an attractive way to balance or even exceed holding costs by using repeated option sales. For buyers facing deadlines, the postponement of which would be expensive or illegal, this kind of option represents the kind of security needed (see Table 1).

Partially perfected ERCs would provide almost the same benefit to buyers, except in the situation in which the buyer exercised the option, but the seller refused or failed to keep its contract and put on control equipment. In such a case no ERC would exist, and the buyer would be unable to go forward with the planned project using that ERC. The buyer could seek legal damages, including any penalties included in the options contract for failure to fulfill the terms of that contract. However, as in all such disputes, the value of such legal rights depends on many factors, including the capability of the non-fulfilling party to pay damages. Thus, in cases where the failure to have an ERC exposes a firm to large risks, this type of option may be unacceptable.

Options on qualified ERCs that are unperfected, would guarantee purchasers an opportunity to gain an ERC, if the State takes no intervening action to require actions that eliminate the ERC in a

---

[5] One method of accomodation to major SIP revisions is to rollback the value of the ERC (in tons per year) the average rollback of all sources. For example, if total emissions in an area must be reduced 15%, a 100 ton per year ERC would be reduced to 85 tons per year.

TABLE I

KINDS OF OPTIONS

	Definition	Protection From Regulatory Change	Readiness For Use
Fully Perfected ERC	Reduction has already been made and certified by the state. The firm is legally bound to a compliance agreement.	High	High
Partially Perfected ERC	Reduction has not been made, but the source has agreed to a compliance schedule and the state has assessed the proposed reduction.	Limited	Medium
Fully Qualified ERC	No reduction has been made nor has the source agreed to adhere to a compliance schedule that has been established by the state based on its evaluation of the magnitude of the proposed reduction.	Very low	Low
Pre-Qualified ERC	No reduction has been made nor has a compliance schedule been set up by the state.	Extremely low	Extremely low

regulation.[6] Ordinarily states will not want to take such actions nor would they be forced to do so. However, some cases exist. For example, if an area does not make Reasonable Further Progress (RFP) or does not achieve the National Ambient Air Quality Standards (NAAQS) on time, the SIP would have to terminate such offers.

Options in this qualified but unaccepted class have the distinct advantage that buyers also know what the option represents if it can be successfully exercised. Since the hard work of qualifying, quantifying and developing a compliance agreement for a proposal has been successfully completed before the producer commits itself to spend money on controls, this type of option is a very good compromise between financial risks and risks associated with not having a viable ERC when needed. This type of option is almost as good as an ERC at a fraction of the up-front cost and risk. Its drawback is a small but real exposure to regulatory loss.

A fourth kind of option is one for a pre-qualified proposal, in which a seller agrees to submit a proposal and sell any resulting ERCs. The buyer has no guarantee of what it is buying under this option. This may not prove to be a problem provided the buyer is seeking the option without a specific project deadline in mind or if the price is low enough. Since the producer need not spend any money, the risk to it is small, especially if the contract calls for the purchaser to bear costs associated with the development and/or implementation of the proposal. This sort of option can be particularly successful for transactions that involve replacing out-of-date process equipment and in which the risks of not qualifying the proposal are neglible. The risks for a buyer of not having a viable ERC will necessarily be substantially higher than other options, but the financial exposure of this type of option may be sufficiently less than other options or ERCs themselves. In some instances it could be a best buy.

---

[6] For example, a new state regulation could require the reduction that would have been used to create an ERC. Unless the source has committed to the change before such an action, no rights exist for an ERC.

Finding Sellers and Buyers

Deciding how to approach firms for producing, selling, purchase of options requires several things. One must assess the needs of the firm, who in the firm can best assess those needs, and who can make decisions. More than the environmental section must be involved. The planners and financial experts for the corporation must also be included.

Various obstacles can exist to gaining needed data. Firms may prefer not to reveal information about their activities. Or, they may want confidentiality agreements. Access to the best level of management may be difficult to obtain. Hassled line managers may prefer to avoid more hassles, despite the potential for reasonable or even large profits available with options. In approaching new or existing clients it is critical that all these possibilities be considered in advance and that methods be used to involve the critics and get their acquiescence. A good presentation must involve every decision-maker in the firm that could stop the project.

Closing on an agreement may be the most difficult phase of the process. Someone in the firm needs to take responsbility, someone who probably is unfamiliar with all the dimensions of the proposal. Consequently, it is critical to involve supporting parts of the organization in the proposal, so that their endorsement is visible to the person or committee making the decision. "Shuttle diplomacy" may be useful in bringing buyers and sellers together as long as it reduces risk and is used not opportunistically to inflate prices. Caution should always be exercised in every negotiation. The key to any successful transaction is development of trust and confidence. Options provide a viable mechanism for reducing upfront risks thus improving the saleability of ERCs. Brokers who use options as a tool of risk reduction will often succeed on what otherwise would be barren ground.

TAX CONSIDERATIONS RELATED TO THE FINANCING, CREATION, BANKING, AND USE OF ERCS

Prepared by:

Peter H. Winslow
E. P. Baker

Scribner, Hall, Thornburg and Thompson
1875 Eye Street, N.W.
Suite 700
Washington, D.C. 20006

January 1981

TABLE OF CONTENTS

		Page
I.	Introduction	1
II.	Role of Brokers Related to Tax Issues	3
III.	Scope of Paper	4
IV.	Definition and Relevance of Tax Terms	5
V.	IRS Offset Rulings	9
	Ownership of Pollution Control Facility	10
	Deduction for the Payment of Operating and Maintenance Expense	11
	Subsidy Payments Taxable to the Source Reducing Emissions	12
	Other Taxable Income of the Source Creating the ERC	13
VI.	Significant Tax Issues	14
	Tax Benefits Available to a Source Creating an ERC	16
	Financing Issues	19
	Administrative Costs Relating to the Creation and Banking of an ERC	22
	Banking of an ERC	23
	Sales of ERCs	24
	Use of an ERC in an Operating Permit	26
	Government Subsidies and Grants of ERCs	27
	Leasing Transactions	28
VII.	Conclusion	29

Exhibit 1
Relationship of Tax Issue to ERC Trading

Tax Considerations Related to the Financing, Creation, Banking and Use of ERCs

I. Introduction

Controlled trading of emission reduction credits (ERCs) offers firms new opportunities to significantly reduce their costs of meeting air pollution control requirements. Under this program, firms now have the option of reducing their control costs by purchasing surplus emission reductions from other firms, by exceeding current control requirements at one point source in return for relaxing controls at another (i.e., use of the bubble policy), or by selling surplus emission reductions to other firms. With a controlled trading system, firms are no longer locked into a rigid regulatory program requiring the installation of specific control equipment at each point source. Controlled trading permits each firm to develop a compliance strategy consistent with the exigencies of its own business and planning goals.

A key element of an effective controlled trading program is ERC banking. A banking system enables more cost-effective compliance with control requirements by allowing firms to receive and store credits for reducing their emissions beyond required levels of control. In areas with banking programs, a firm now has an incentive to initiate emission reductions beyond current requirements when it is economically feasible to do so. Credit for the surplus emission reductions can then be banked providing cost-savings through future sale or use at another point source (e.g., in a bubble or to accommodate plant expansion), or to use in the event SIP standards are later revised.

With the added flexibility of being able to buy and sell emission reduction credits, a number of different options are available to firms in developing their compliance strategies. Most importantly, these options have significant profit and loss implications affecting emission control costs and the financial well-being of the firm. For example, in a number of recent bubble applications firms anticipate a savings of more than $5 million. Savings for the seventy bubble applications currently in the regulatory process are estimated to average $2 million.

In evaluating decisions to create, purchase, bank, or use ERCs, firms will want to carefully evaluate their costs and potential savings in each transaction. Tax consequences play an important part both in the firm's initial decision to create an ERC and in determining its use.

IRS treatment of various ERC transactions will affect their financial desirability. For example, there can be a significant difference in the cost and therefore desirability of creating an ERC where industrial development bonds are used as a means of financing the installation of control equipment, instead of using debt-financing from private sources. Although a firm is entitled to a tax deduction for its interest payments in a private financing transaction, these interest deductions will not compensate for the burden of interest payments at high commercial rates. In comparison, industrial development bonds can be sold at lower rates (because interest income on such bonds is tax-exempt when received by bondholders), with the savings passed on to the firm which reduces emissions.

Tax implications not only can influence the method of financing ERCs selected by a firm, but they also can influence the way in which this commodity is used once it is created. For instance, a firm that creates surplus reductions with the aim of selling the credit may achieve significant tax savings by banking the ERC and holding it for more than one year before it is sold to avoid paying higher taxes on a short-term profit. Further savings through deferral of tax liability can result if the negotiated ERC sales agreement is structured as an installment contract.

Through negotiation and careful tax planning, applicable tax benefits and burdens can be distributed among firms participating in an ERC transaction in the most desirable fashion. Where tax results may be in doubt, however, securing a private letter ruling from the IRS as to the tax consequences may be an essential consideration in structuring an ERC transaction.

The types of tax issues firms will want to consider in evaluating ERC transactions include the following:

- Can tax-exempt industrial development bonds be used to create a surplus emission reduction or purchase an ERC?
- Does pollution control equipment used to create an ERC qualify for 60-month rapid amortization?
- Can the costs of purchasing an ERC be amortized?

- Will proceeds from the sale of ERCs be taxed as long-term capital gains?

- Will a firm be taxed on government grants made to subsidize the cost of creating or purchasing an ERC?

These and related issues are addressed in this paper.

II. Role of Brokers Related to Tax Issues

Because tax considerations play a key part in any financing arrangement or transfer agreement, brokers will want to be able to advise their clients of the tax consequences that will result from the various ways in which an ERC tranaction can be structured. For example, from the standpoint of the firm creating an ERC, a broker can assist in evaluating the alternative methods of financing the emission reduction, such as by using industrial development bonds, leasing pollution control equipment, or soliciting government grants or subsidies. Decisions also will have to be made as to the most desirable way of using or disposing of an ERC after it is created.

Brokers also will provide advice to firms needing to purchase ERCs for use in a bubble, as offsets in a nonattainment area, or for investment. A prospective purchaser may engage a broker to locate an appropriate seller (i.e., the creating firm, dealers or a government agency) and to negotiate a favorable transfer agreement. As with control equipment financing transactions, tax considerations can determine the best way of funding the acquisition of an ERC. Potential purchasers will want to compare ERC leasing arrangements to the use of debt-financing.

Brokers also may wish to act as dealers by buying, selling and trading ERCs on their own account. Tax consequences can determine the structure and timing of a broker's own ERC transaction.

Whether or not a firm participates in a banking and trading transaction will depend on its ability to reduce its costs of meeting pollution control requirements. An important part of the broker's role will be assisting firms in reducing these costs. Because of the significance and complexity of the tax consequences of ERC transactions and because of the many alternatives available for structuring these transactions, the services of brokers knowledgeable in tax matters will be particularly helpful in maximizing the benefits of ERC banking and trading.

III. Scope of Paper

This paper will discuss the key tax issues relating to ERC transactions. The paper has three parts. The first presents the basic tax terms and outlines their importance in ERC transactions. The second examines the tax consequences in a major offset case which occurred as a private transaction outside the context of a structured banking system. Although the offset case discussed is probably atypical, it is important because it is the first ERC transaction in which the IRS has ruled on the tax consequences. The IRS ruling demonstrates the tax complexities that can occur, particularly where a market in ERCs has not been established.

The last part of the paper will identify and discuss important tax issues relevant to ERC transactions and to the creation, banking, and use of ERCs. The discussion of the relevant tax issues is in a question and answer format. Readers are cautioned that other than the offset case discussed in the second part of this paper there is no established precedent in the tax law for dealing with transactions involving ERCs. The IRS has not had an opportunity to examine the most important issues. With respect to most issues, existing IRS rulings and regulations provide little direct guidance. Consequently, reliance by firms on any specific tax treatment of a proposed ERC transaction may not be advisable in the absence of an IRS private ruling.

It also must be borne in mind that each individual ERC transaction will differ, depending on the circumstances. In addition, applicable state banking and bubble rules can vary. Therefore, tax results may differ significantly even in similar circumstances.

In examining the tax issues relating to ERC transactions, care should be taken to distinguish between those issues affecting pollution control equipment which may be purchased to create an ERC and those affecting the ERC. For tax purposes, an ERC will be treated as a separate valuable commodity, distinct from the equipment. These two assets will have different tax characteristics requiring independent consideration.

The discussion of tax consequences in this paper represents a preliminary analysis of the issues. The conclusions are tentative and subject to IRS review. A more detailed analysis of the relevant issues will soon be available from EPA's Controlled Trading Program.

IV. Definition and Relevance of Tax Terms

Before examining the tax implications of specific types of ERC transactions, it is useful to outline the basic tax concepts that must be considered in evaluating the tax consequences of these transactions.

Tax-Exempt Industrial Development Bonds

Interest received by bondholders on qualified industrial development bonds is not taxed. The greatest potential for industrial development bond financing is with large issues (e.g., over $10 million). But, large issues can only be used for the purpose of constructing "air pollution control facilities" and therefore exclude process changes and pollution prevention equipment. Major tax questions that arise with large issue industrial development bond financing concern the type of equipment that qualifies as an "air pollution control facility" and whether the creation of a valuable ERC will preclude this type of financing.

Investment Tax Credit

Taxpayers can claim a ten percent investment tax credit for qualified investments in business property. For 1981, the total credit can equal the first $25,000 of tax liability, plus 80 percent of the excess over $25,000. The credit only applies to depreciable, tangible personal property used in the taxpayer's trade or business. The availability of an investment tax credit for the acquisition of pollution control equipment may ease the financial burden of creating an ERC. The purchaser of the ERC will not be entitled to an investment tax credit for its capital outlay, because the ERC is intangible property.

Depreciation or Amortization

A depreciation or amortization deduction is available for business or investment property that has a limited useful life of more than one year. Certain accelerated depreciation methods allowing disproportionate deductions in early years are available for tangible business property, such as pollution control equipment. Straight-line amortization usually must be taken for intangible property, such as an ERC, with a limited useful life. How ERCs are defined in state implementing rules (e.g., whether they must be used within a specified period of time) may determine whether ERCs can be amortized while banked. Once withdrawn from the bank and used in a permit, amortization deductions for the costs of an ERC may be available over the life of the operating facility.

60-Month Rapid Amortization

In lieu of claiming a depreciation deduction, a firm may elect to amortize a portion of the cost of a certified pollution control facility over a 60-month period. If the facility is financed by tax-exempt industrial development bonds, the election of 60-month rapid amortization potentially results in a reduction in the investment tax credit available to the firm. The tax benefits of each alternative must be weighed to determine whether rapid amortization is desirable.

Capital Asset

Gain realized on the sale of a capital asset can be accorded favorable tax treatment. Capital assets do not include (1) stock in trade or inventory, (2) property held primarily for sale to customers in the ordinary course of business, and (3) depreciable business property. The primary factor in determining whether an ERC is a capital asset is the owner's motive in holding it (i.e, for investment or for sale to customers). A banked ERC may constitute a capital asset. Although pollution abatement equipment generally will not be a capital asset, long-term capital gain treatment still may result when it is sold to the extent gain is greater than prior depreciation deductions. An ERC held by dealers for sale to customers will not be treated as a capital asset. Consequently, a dealer's profit realized on the sale of an ERC will be ordinary income, rather than capital gain.

Long-Term Capital Gain

Gain on the sale of capital assets generally is tax-favored only if it is held for more than one year. Gains on the sale of capital assets held for a shorter period are treated as short-term capital gain potentially taxable as ordinary income. The period of time during which an ERC is banked before it is sold may determine whether favorable long-term capital gain treatment will occur.

Basis or Adjusted Basis

Basis and adjusted basis are key factors in determining the amount of the depreciation deduction as well as the gain or loss upon a disposition of property. The original basis of property is its purchase price or cost, whether paid in cash or in notes or other debt instruments. Basis also includes commissions or other expenses connected with the purchase. While property is held, basis is adjusted by increasing it for all expenditures related to the property chargeable to the capital account and by reducing it by depreciation or obsolescence deductions. In ERC transactions, a tax basis must be established for the pollution control equipment used to achieve an emission reduction, as well as for an ERC that is created or purchased. The basis will determine the amount of depreciation or amortization deductions for the abatement equipment and the ERC. An important basis question is whether any costs incurred in achieving a surplus emission reduction should be allocated to the basis of the ERC, or whether all of these costs are included in the basis of the pollution control facility.

Loss Deduction

A loss deduction is available where a firm decides to dismantle, abandon, or sell its plant or machinery. The loss will be determined by the adjusted basis of the plant or machinery. To support a claim for a deduction there generally is no requirement that the firm entirely terminate business operations or refrain from replacing the abandoned property. A loss deduction can occur where an ERC is created by a source shut-down, the replacement of out-moded pollution control equipment, or a change in an industrial process. A loss also could result if SIP revisions result in the forfeiture of a banked ERC. Firms will want to determine how profits from the sale of ERCs created by cutbacks and shutdowns will affect their claim for a loss deduction.

Contributions to Capital

Contributions to the capital of a corporation generally are not taxed to the corporation. Contributions to capital can be made through government grants or subsidies. Such grants qualify for tax-free treatment if (1) the grant becomes part of the working capital of the corporation, (2) it is not compensatory, (3) it is bargained for, (4) it will benefit the corporation, and (5) it may contribute to the production of additional income of the corporation. In the context of ERC transactions, contributions to capital may come in the form of government subsidies made for the purpose of reducing emissions to create ERCs or government grants of ERCs made as an inducement to firms to locate in an area or to retain existing firms. Firms will want to know under what circumstances government subsidies and grants will be tax-free and what consequence tax-free treatment will have on other tax benefits available (e.g. depreciation deductions).

Rental Deduction

In a leasing transaction, the leasee obtains a deduction for rental payments and the owner of the property includes the rental payments in taxable income. A leasing transaction can occur for both pollution control equipment and for an ERC that is created by the emission reduction. A rental deduction is not available if the lessee's payments result in the acquisition of an ownership interest in the property. The primary tax consideration for firms engaging in a leasing transaction is to make sure that the IRS will not recharacterize the arrangement as a sale.

Capital Expenditure

A capital outlay made to acquire property that has a useful life of over one year is not deductible as a business expense. Instead, the expenditure is capitalized and becomes part of the basis of the property acquired. Tax recognition of the expenditure is accorded through depreciation deductions during the useful life of the property. Firms will want to know which expenditures incurred in an ERC transaction must be captalized. Expenditures for the acquisition of pollution control equipment and ERCs generally will be treated as capital expenditures, while costs incurred in operating and maintaining pollution control equipment will be deductible on a current basis as ordinary business expense.

The concepts described in this section highlight the main tax issues facing firms contemplating ERC transactions. Although the majority of these issues have yet to be resolved, the next section, which presents the IRS ruling in a major offset case, provides some useful insight into the important considerations in resolving some of these unanswered issues.

V. IRS Offset Rulings

At present, the IRS has not ruled on most of the issues involving the creation, banking and use of ERCs. However, in two related rulings, Rev. Rul. 79-264 and Letter Ruling 7950049[1], the IRS considered the tax consequences in a transaction where a new source seeking an offset finances an emission reduction on the premises of an unrelated party.

The facts of the IRS rulings probably do not represent a typical offset transaction and did not involve ERC banking. The rulings are nevertheless important because they are the first legal precedent dealing with the tax aspects of an offset transaction.

The underlying facts in the rulings apparently were based on the aborted SOHIO offset transaction. In 1976 SOHIO initiated permit negotiations for the construction of a marine terminal, petroleum-storage facility, and oil pipeline terminals in Long Beach, California. SOHIO proposed to obtain required offsets from a number of sources including Southern California Edison through the installation of a scrubber and combustion temperature controls on its electrical generating unit. The proposed offset transaction called for SOHIO's payment of approximately $78 million to the utility for the construction, installation, and operation of the control equipment which SOHIO would own.

In 1979, SOHIO abandoned the offset transaction citing project killing delays in government permit procedures and the likelihood of protracted legal challenges to the arrangement. By providing a reservoir of approved ERCs readily available to new or expanding sources, one of the goals of an ERC banking program is to reduce regulatory delays and to increase legal certainty, the two main problems encountered by SOHIO.

---

[1] Revenue Rulings represent the IRS's application of the law to a hypothetical set of facts that may have been derived and abstracted from an actual case. Revenue Rulings are published by the IRS in the Cumulative Bulletin and generally may be relied upon by all taxpayers. A letter ruling issued by the IRS involves the facts of a particular situation and can be relied upon only by the taxpayer to which it is issued. Copies of private letter rulings with identifying facts deleted may be obtained from the IRS upon request.

The SOHIO offset transaction is unusual in that SOHIO would have reimbursed Southern California Edison for its costs in reducing emissions and would have retained ownership of the scrubber installed at the utility's plant. Another unique aspect of the transaction was that the installation of the scrubber would not have effected a cost savings for the utility or reduced its cost in achieving compliance with ambient air pollution control standards. In a typical ERC transaction where a banking program has been established the existing firm will initiate its own emission reduction, retain ownership of the control equipment and possibly satisfy control requirements in addition to creating an ERC.

The aborted SOHIO offset transaction raises tax questions concerning:

- Which firm is treated as the owner of the pollution control equipment for depreciation, rapid amortization, and investment tax purposes?

- Does the company with the existing source (Southern California Edison) recognize taxable income on the transaction?

- Which company is entitled to a deduction for expenses incurred in operating the control equipment?

These issues were addressed by the IRS in its rulings.

Ownership of Pollution Control Facility

The SOHIO offset transaction could have been structured so that either company would be considered the owner of the control equipment acquired to achieve the emission reduction. Establishing ownership is important because it determines which company is entitled to the investment tax credit and rapid amortization or depreciation deductions. In cases not involving ERC transactions, the company that bears the economic benefits or burden of any increase or diminution in the value of the property generally will be considered its owner by the IRS.

In Rev. Rul. 79-264 and Letter Ruling 7950049, the IRS listed the following factors as controlling in its ruling that the new source financing the emission reduction would be considered the owner of the control equipment. (S (SOHIO) is the company seeking offsets through emission reductions on E's premises):

- S possessed legal title to the scrubber;
- S had a contractual duty to pay for all of the capital investment in the scrubber;
- S had the responsibility to pay maintenance and operating costs;
- S had the duty to pay taxes levied on the scrubber;
- S bore the risk of loss if the scrubber was destroyed or condemned;
- S bore the risk of diminution in value of the scrubber due to obsolescence or exhaustion;
- S enjoyed the benefits of the scrubber throughout its entire useful life; and
- the scrubber satisfied pollution abatement conditions imposed on S and was an ancillary activity relating to the operation of S's new source.

Any alternative transaction outside of the banking process that contemplates a continuing relationship between the parties must be carefully structured to ensure that the company that is intended to benefit from the depreciation or amortization deduction and investment tax credit will be recognized by the IRS as the owner of the property.

Rev. Rul. 79-264 and Letter Ruling 7950049 provide guidelines for companies to follow in a private offset transaction to secure IRS recognition of the firm seeking an offset as the owner of the control equipment. As stated earlier, ownership of the pollution control facility by the firm seeking an offset is unusual. With a banking system firms able to create surplus reductions can evaluate their own tax benefits independently of the ERC purchaser.

Deduction for the Payment of Operating and Maintenance Expense

In its rulings, the IRS recognized the business necessity of obtaining offsets to operate in a nonattainment area. It ruled that a new source is entitled to a deduction for the cost of operating and maintaining control equipment used to create an offset on the premises of an existing source. The factual pattern in the rulings involved ownership of the abatement equipment by the new source, rather than the source that created the emission reduction. If ownership is retained by the existing source, however, the new source nevertheless should be able to deduct its costs in reimbursing the existing source for its operating and maintenance costs.

In the IRS rulings, the actual cost of reducing emissions (i.e., acquiring and installation of the scrubber) served as the purchase price. The facts of the rulings indicate that the existing source did not obtain an economic benefit from the transaction. With ERC banking this will not be the case. Since market factors and not just costs will be the primary influence on the purchase price of an ERC, a firm creating a surplus emission reduction can sell its ERC at a profit. This profit-making potential will inject additional tax implications into a firm's decision as to how to best use an ERC it has created.

Subsidy Payments Taxable to the Source Reducing Emissions

In its rulings, the IRS has not been consistent in its treatment of the existing source receiving payments from a new source subsidizing the cost of achieving a surplus emission reduction. In Rev. Rul. 79-264, the IRS ruled that to the extent the recipient of the subsidy payments acts as an independent contractor in the construction, operation, and maintenance of the abatement equipment:

- it must include in gross income any reimbursement payments received from the new source; and
- it may deduct all ordinary and necessary expenses incurred in constructing, operating and maintaining the equipment.

The IRS reached a different result in Letter Ruling 7950049. It ruled that the recipient:

- will not realize income to the extent reimbursements received from the new source do not exceed expenditures;
- will not be entitled to deductions for expenditures to the extent that it has a right to reimbursement; and
- will be entitled to a deduction for expenditures only to the extent they exceed reimbursements.

While the different approaches of Rev. Rul. 79-203 and Letter Ruling 7950049 do not have much effect where reimbursement and expense payments occur in the same taxable year, the tax consequences can be significant if payments are paid or accrued in different taxable years. For instance, significant expenses could be incurred for which reimbursement payments are received or accrued the following year. Under the approach of Rev. Rul. 79-203, the company could receive a tax benefit through the mismatching of the deduction and income items, i.e., a deduction in the earlier year and recognition of income in a later year. Under the approach of Letter Ruling 7950049, no such tax benefit is available.

Other Taxable Income of the Source Creating the ERC

A firm that receives subsidy payments to finance the reduction of emissions may receive many incidental benefits from the transaction. These could include:

- satisfaction of SIP requirements imposed on the recipient;
- production economies; and
- income from the sale of byproducts.

In its rulings, the IRS stated that the recipient of the benefits presented above did not realize taxable income from the installation and use of control equipment on its premises. Six reasons were given for this conclusion:

(1) the recipient had no duty to reduce air pollution;

(2) if the recipient's facilities became subject to air pollution regulations, replacement of the abatement equipment would have been necessary to satisfy those regulations;

(3) the equipment did not increase the production or capacity of the recipient;

(4) the equipment did not effect an increase in revenue or any cost savings to the recipient;

(5) the equipment did not increase the useful life of the recipient's facilities; and

(6) title and beneficial ownership of the equipment remained with the source providing the subsidy payments.

The possible implication of these rulings is that the recipient of subsidy payments may realize gross income if one or more of these factors is absent. Such a potential result is underscored in Letter Ruling 7950049 which states that no opinion is expressed as to the tax consequences to the recipient in a situation where the control equipment satisfies any duty to reduce pollution imposed on that company.

It is difficult to understand why the IRS considers these factors significant. It may be true that installation of the equipment can economically benefit the recipient of subsidy payments by reducing its costs in complying with pollution regulations or by increasing its operating capacity, but these benefits will be realized through greater profits in the future. The appropriate time to tax these economic benefits is when those profits are realized, not when the indirect benefits are conferred. This aspect of the IRS rulings creates a degree of uncertainty in a SOHIO-type offset transaction in the more typical case where the existing source receives an economic benefit in addition to reimbursement payments for the cost of creating a surplus emission reduction.

VI. Significant Tax Issues

This part of the paper will discuss in a question and answer format the major tax issues that arise with respect to ERCs. It is divided into eight sections dealing with tax aspects of typical ERC transactions. The tax issues discussed in these sections occur at various stages of the banking and trading process. See Exhibit 1. It is important to keep in mind that the tax issues may affect ERC buyers and sellers differently at each stage of the process.

- Tax Benefits Available to a Source Creating an ERC: Various tax benefits are available to a firm that undertakes to reduce emissions. Where emission reductions are created by a plant shutdown or curtailment a firm may be entitled to a loss deduction for its unrecovered costs in the abandoned plant or process. Where reductions are achieved through the

EXHIBIT 1

Relationship of Tax Issue to ERC Trading

CREATING ERCS

- use of accelerated depreciation
- use of 60-month rapid amortization
- availability of investment tax credit
- selection of source of funds to finance purchase of control equipment (e.g., industrial development bonds or loans)
- tax treatment of operating and maintenance expenses
- availability of loss deductions

CERTIFYING ERCS

- determination of tax basis of ERC
- treatment of administrative expenses as capital expenditures

BANKING ERCS

- availability of amortization deduction

SALE OF ERCS

- capital gains vs. ordinary income
- lease vs. sale arrangements
- treatment of government grants of ERCs

USING ERCS

- availability of amortization deduction purchase and installation of pollution abatement equipment, tax benefits in the form of accelerated depreciation or rapid amortization deductions or the investment tax credit may be derived as a result of the firm's expenditures. Section 1 considers whether the creation of an ERC will have an impact on these tax benefits.

- Financing Issues: Section 2 discusses the major tax considerations where an emission reduction is funded by another public or private financing source, such as through tax-exempt industrial development bonds or by loans.
- Administrative Costs Relating to Creating and Banking an ERC: Section 3 deals with the tax treatment of administrative costs in qualifying and certifying an ERC. These costs are to be distinguished from the expenditures incurred in actually reducing emissions which are considered in Section 1.
- Banking of an ERC: Section 4 discusses whether an ERC can be amortized during the period it is banked.
- Sale of ERCs: A sale of an ERC has tax consequences to both the purchaser and seller. The purchaser will need to know whether tax benefits are available for his cost of acquisition. The seller may recognize taxable income on the transaction. Section 5 explores these issues.
- Use of an ERC: After an ERC is used and incorporated into an operating permit, it loses its status as a marketable commodity. Section 6 considers whether the cost of acquiring an ERC can be amortized after it has been used.
- Government Subsidies and Grants of ERCs: Section 7 considers the tax consequences to a business that receives a grant of an ERC or government subsidies to reduce pollution. ERC grants most likely will occur where a governmental agency (e.g., an industrial development agency) seeks to entice a business to locate in a nonattainment area or to retain an existing firm threatened with closure due to pollution control requirements.

- Leasing Transaction: Depending on the applicable banking and trading quidelines, firms may want to lease rather than purchase ERCs. An ERC leasing transaction could be beneficial where a firm needs an emission reduction for only a short duration during a transitional, start-up, or winding-down period. In addition to the leasing of ERCs, control equipment leasing may be a means of financing the creation of surplus emission reductions. Section 8 considers tax issues relating to leasing transactions.

1. Tax Benefits Available to a Source Creating an ERC

To illustrate the potential tax benefits of reducing emissions through the purchase of control equipment, source shutdown, or process change, it is helpful to provide a representative example. A large industrial company operates a manufacturing process in a nonattainment area. For sometime the company has used a baghouse to reduce emissions of particulates resulting from the coal combustion. This process satisfies current SIP requirements for the existing facility. The company is considering adding on a electrostatic precipitator to further reduce particulate emissions significantly below current requirements. The company is aware that emission reductions are scarce in its geographic area and a new or existing source would be willing to pay a considerable price for an ERC to enable it bubble or to locate in the nonattainment area.

The company's decision to adopt the new method for reducing emissions has many potential tax ramifications:

- the company may claim an investment tax credit for the cost of acquiring the new electrostatic precipitator;

- when the new equipment is placed in service, the company can claim a depreciation deduction;

- if the electrostatic precipitator qualifies as a pollution control facility, the company, in lieu of claiming a depreciation deduction, could elect 60-month rapid amortization;

- the company can deduct the costs of operating and maintaining the new equipment; and

- if the baghouse is abandoned or sold for its scrap value, the company may be entitled to a loss deduction for its uncovered costs incurred with respect to the baghouse.

In determining whether to incur the expense of acquiring the new electrostatic precipitator and creating an ERC, the company would take these tax advantages into account. This section considers whether the creation of an ERC will have any adverse impact on these tax benefits.

Will the investment tax credit, depreciation or elective rapid amortization for the cost of a pollution control facility be available if an ERC is created?

When a firm makes capital outlays for property with an extended useful life, it cannot claim a current tax deduction for its costs. Instead, the firm must estimate the useful life of the asset and its salvage value and charge off the cost of the asset over the period it is used in the business. To stimulate capital formation, Congress has provided for the use of several accelerated depreciation methods for business equipment that have the effect of permitting disproportionate depreciation deductions in the first years the equipment is used in the business. An additional incentive, the investment tax credit, is available in the year the equipment is placed in service. Finally, special rules providing significant tax benefits through rapid amortization deductions have been enacted by Congress to stimulate the acquisition of pollution control equipment. A firm may elect to amortize a portion of the cost of newly-acquired equipment over a 60-month period to begin in the month following completion or acquisition of the facility or with the first month of the following taxable year. But, only equipment that is certified as a "pollution control facility" by state and federal authorities and does not reduce the firm's total operating costs qualifies.

Firms are limited in selecting among the available tax benefits. Elective rapid amortization can only be used in lieu of depreciation deductions otherwise allowable. If acquisition of the equipment is financed by tax-exempt industrial development bonds, election of rapid amortization over a 60-month period potentially results in a reduction of the investment tax credit available to the company. Firms must carefully evaluate which of these tax provisions are applicable to their investment in creating ERCs and which will provide the most tax benefits.

The creation of an ERC should not affect the firm's right to an investment tax credit or accelerated depreciation for the pollution control equipment. However, the IRS could argue that 60-month rapid amortization is not available for the equipment because the profit realized on the sale of a ERC may have the effect of reducing total operating costs. Nevertheless, the chances are good that the IRS will not adopt this position.

What will be the tax basis of newly-acquired control equipment?

The tax basis assigned to pollution control equipment purchased to reduce emissions will be the costs incurred by the firm in acquiring, constructing, or installing it. The tax basis of the equipment should not be affected even though an ERC is created. This is true even in cases where equipment is installed for the specific purpose of creating an ERC. Where the equipment in part satisfies a control requirement and in part creates an ERC, no portion of the cost of the equipment should be subtracted from its basis and allocated to the ERC.

The tax basis of the equipment is important in determining the tax benefits to be derived from the acquisition. Basis will determine the amount of the firm's:

- investment tax credit;
- depreciation deduction;
- elective rapid amortization deduction, if the equipment qualifies as a pollution control facility; and
- taxable gain or loss on the subsequent sale or abandonment of the equipment.

Will the creation of an ERC through source shut-down, curtailment in operations, or replacement of out-moded equipment affect otherwise available loss deductions?

A company generally is entitled to a deduction for a loss incurred on the shut-down, abandonment, or sale for scrap value of its plant or equipment. The loss deduction is measured by the company's basis remaining in the plant or equipment less any salvage value or compensation for the loss received by the company.

A firm should be allowed a loss deduction even if the shut-down, abandonment, or sale results in the creation of a valuable ERC. It is unlikely that an ERC created in this manner will be treated for tax purposes as compensation for the firm's loss.

2. Financing Issues

Emission reductions can be achieved through funding from several outside financing sources:

- use of tax-exempt industrial development bonds;
- payment by unrelated new sources seeking offsets;
- payment by unrelated sources within a bubble;
- loans or private bond issues; or
- equipment leasing.

Public financing through industrial development bonds frequently is the most attractive alternative. Industrial development bond financing is only available in a limited number of situations, however. Where available, use of this financing tool also has drawbacks that must be evaluated. A firm will give up the full benefit of elective 60-month rapid amortization, if industrial development bonds are used. The most important issue with respect to industrial development bonds is whether the creation of a valuable ERC precludes their use as a method of financing emission reductions.

Another alternative is funding through term loans, project loans, or a private bond issue. The firm's deduction for interest payments on the loan or bond and its tax basis in the equipment used to purchase the equipment are the primary tax considerations in a borrowing arrangement.

Can tax-exempt industrial development bonds be used to finance the installation of pollution control facilities to create an ERC?

The three most common methods of qualifying the acquisition of pollution control equipment for tax-exempt industrial development bond financing are:

(1) a small issue of $1 million or less;

(2) acquisition of facilities costing $10 million or less; or

(3) issues of unlimited amount for the acquisition of a qualified "air pollution control facility."

For larger bond issues, at least 90 percent of the bond proceeds must be used to acquire a qualified "air pollution control facility" to make tax-exempt industrial development bond financing feasible. An "air pollution control facility" is depreciable business property used to abate or control air pollution or contamination by removing, altering, disposing, or storing pollutants, contaminates, wastes, or heat. It can be designed to exceed applicable federal, state, and local requirements for the control of atmospheric pollutants or contaminants (e.g., it can create an ERC), but equipment built in anticipation of capacity expansion may not qualify because it does not currently control pollution.

Restrictions in regulations proposed by the Treasury Department may effectively preclude this type of industrial development bond financing for:

- process changes that control or prevent pollution;
- equipment that prevents the creation of pollutants, rather than equipment that operates at the end-of-the-pipe (e.g., coal washing facilities);
- equipment that treats materials or heat that are no longer pollutants;
- equipment that disperses pollutants, rather than abates them;
- equipment that prevents the release of pollutants but which causes an imminent risk of damage or injury to property, employees or other persons;
- equipment that prevents the release of pollutants in a major accident;
- equipment used to control pollution but which would be considered a public nuisance; and
- equipment that has been used as a customary practice in the industry, and is not required for reasons of compliance with pollution control requirements.

Even if none of these restrictions apply, the IRS could adopt the position that tax-exempt industrial development bond financing for control equipment is not available to the extent the firm is able to recover all or part of its investment through the sale of an ERC. Existing regulations provide that the full cost of the facility only can be financed with tax-exempt bonds if the expenditures for the property would not be made "but for" the purpose of controlling pollution, and if the equipment acquired has no "function" other than controlling pollution. If the facility is constructed for a dual purpose, only the "incremental cost" of fulfilling the pollution control purpose qualifies, i.e., the excess of the total cost of the facility over the cost expended for a purpose other than the control of pollution.

At this time it is unclear whether the IRS will deny tax-exempt industrial development bond treatment because a valuable ERC is created. But, there are strong arguments to support the position that an ERC is not the type of economic benefit that should preclude industrial development bond financing. The cost savings contemplated by the proposed regulations are the type that are directly derived from the operation or "function" of the facility. In contrast, the economic advantages that can be derived from an ERC stem from the rules implementing the Clean Air Act, not from the operation of the control equipment.

If qualification of equipment as an "air pollution control facility" is in doubt, financing through tax-exempt small issues may be a viable alternative. If the aggregate face amount of the bond issue is $1 million or less, tax-exempt industrial development bonds may be used for the acquisition, construction, reconstruction, or improvement of land or depreciable business property, including pollution control equipment without the restrictions imposed upon larger issues.

A second funding alternative is available if substantially all of the proceeds of a $10 million small issue are used for the acquisition, construction, or improvement of land or depreciable business property. This funding alternative is not available, however, if the facility and other capital expenditures made by the firm in the same locality cost more than $10 million, even if the aggregate face amount of the issue is less than $10 million. In determining whether the $10 million limitation had been exceeded, costs chargeable to the company's capital account incurred during the six-year period beginning three years before the date of the issue and ending three years after the issue are taken into account. A significant limitation on the use of a $10 million small issue is that the firm's total capital expenditures made during the six-year period in the same municipality or county cannot exceed $10 million.

What are the tax consequences where pollution control equipment is acquired using borrowed funds or funds secured through a private bond issue?

An important financing alternative for the creation of an ERC is to take out a loan or issue bonds, and use the proceeds to purchase the pollution control equipment. In a loan transaction, the firm is entitled to a deduction for interest payments. However, no deduction is available for principal payments made in repayment of the loan or payments made in redemption of bonds.

A significant tax benefit from a loan transaction is that it creates "leverage" for the borrower. This means that a firm is able to use the borrowed funds to acquire a large tax basis in the purchased equipment. Thus, for a relatively small initial capital investment, the firm can obtain disproportionate tax benefits through the investment tax credit, accelerated depreciation, or elective 60-month rapid amortization measured by the full cost of the equipment.

3. Administrative Costs Relating to the Creation and Banking of an ERC

In section 1 tax considerations relating to the costs of acquiring and installing pollution control equipment were discussed. Generally, tax benefits for acquisition and construction costs is obtained through the investment tax credit and deductions for depreciation or amortization over the life of the equipment.

This section deals with administrative costs incurred by a firm in qualifying, quantifying and certifying an ERC. Before deciding to initiate an emission reduction, a firm may incur costs in consulting with appropriate agencies and estimating the credit potentially available. Engineers may be needed for testing and measuring emission reductions, preparing applications, or rewriting permits. Attorneys may be hired to represent a firm during the certification process. If the firm is not operating under an effective permit, costs may be incurred in establishing and documenting a baseline of current emissions for measuring any potential reduction. The responsible agency also may decide to pass on to the firm as a permit fee the agency's costs incurred in quantifying an emission reduction or revising the source's permit.

The primary issues relating to administrative costs incurred during the certification process will include:

- whether the expenses may be currently deducted or must be captalized; and
- what will be the tax basis of the ERC?

Can the administrative costs incurred in qualifying and certifying an ERC be deducted?

An expenditure made to acquire property with a useful life of over one year is not deductible for tax purposes. Consequently, a firm is not entitled to a deduction for the administrative costs incurred during the certification and banking process because the ERC created has an extended life. The administrative expenses must be capitalized which means that the costs are added to the tax basis of the ERC and accorded tax recognition either through allowable amortization deductions or through a reduction in the taxable gain realized when the ERC is sold.

What is the tax basis of an ERC owned by the firm creating it?

The basis of an ERC owned by the firm that created it will be the administrative costs incurred during the certification and banking process. The basis in the ERC probably will not include any costs relating to the acquisition and installation of the pollution control equipment responsible for the emission reduction. The equipment will have its own distinct basis.

The tax basis of an ERC is important in determining the creating firm's:

- amortization deduction, and
- taxable gain on the sale of the ERC.

4. Banking of an ERC

Once an emission reduction is qualified, quantified, and certified, the ERC may be used, sold, or banked. This section considers the tax issues that relate to the ERC after banking has occurred. A company that decides to participate in the banking program may have no intention of immediately using the ERC. The company may consider it advantageous to retain the banked ERC:

- to satisfy more stringent emission requirements that may be anticipated in the future;
- for later sale or lease to another firm when market conditions are more favorable;
- for future use as an offset or within a bubble application.

The primary issue relating to a banked ERC that has not been sold or used to meet a permit requirement is whether the ERC's cost basis may be amortized or depreciated.

Is an amortization deduction available for the cost of a banked ERC that has not been used?

Whether an amortization deduction will be allowable for the cost of a banked ERC may depend upon applicable state banking rules. An amortization deduction is available only where a useful life of the ERC can be established. Consequently, where banking rules do not provide an expiration date for an unused ERC, an amortization deduction probably will not be allowable during the banking period.

Even if state banking rules established an ERC forfeiture date, the IRS could take the position that the ERC is a nonincome-producing investment asset not subject to amortization. The IRS has lost in court cases, however, where it has made this argument with respect to other investment assets held by individuals.

If amortization of a banked ERC is allowable, the deduction would be taken on a straight-line basis. Accelerated or 60-month rapid amortization probably would not be available.

5. Sales of ERCs

The most common method of disposing of an ERC will be by a sale transaction. Typically, the company needing an ERC to expand its operations in a nonattainment area or to reduce its control costs through use of a bubble will acquire it from the source creating it, a governmental agency, or a dealer. An ERC may be acquired for cash or deferred obligations.

Alternatively, a source needing an ERC could purchase another company's entire business and in that manner acquire the ERCs owned by the company.

The primary tax considerations that arise for the firm acquiring an ERC are:

- Are the acquisition expenditures currently deductible or must they be capitalized; and if capitalized, what is the tax basis in the ERC? (These issues are important for purposes of determining the amount of amortization deductions, gains or losses on subsequent resales, and losses upon abandonment or in the event of confiscation through SIP revisions.)
- Can tax-exempt industrial development bonds be used for financing the acquisition of an ERC?
- Can the benefit of the investment tax credit be obtained for the purchase of an ERC?

The most important tax issues relating to the seller of an ERC are:

- How is the taxable gain or loss on the sale measured?
- What will be the character of the gain or loss, i.e., long or short-term capital gain or loss, or ordinary income?

What are the tax consequences to the purchaser of an ERC?

The purchaser of an ERC cannot currently deduct the purchase price because the ERC is a valuable commodity having an extended useful life. Acquisition costs must be capitalized and become part of the basis of the ERC.

After the acquisition, the purchaser can amortize its cost for the ERC in the same manner as if it had been the source creating it, but only if amortization is otherwise available for an unused ERC. (See the discussion of amortization of banked ERCs in section 4.) The benefits of 60-month rapid amortization, accelerated depreciation, and the investment tax credit are not available because an ERC is an intangible asset. Theoretically, it may be possible to use tax-exempt industrial development bond financing to purchase an ERC, but such financing ordinarily is not used for the purchase of intangible assets, such as ERCs. A specific ruling on this matter is advisable before proceeding.

What are the tax consequences to the seller of an ERC?

A seller of an ERC will realize taxable gain or loss measured by the difference between the amount realized in the sale transaction and the seller's basis in the ERC, as adjusted for prior amortization deductions. The creator of an ERC or an investor will derive tax-favored long-term capital gain treatment only if the ERC has been held for over one year. For dealers regularly buying and selling ERCs, the transaction will result in "ordinary" gain or loss.

6. Use of an ERC in an Operating Permit

The final component of the banking system is the use of an ERC through its incorporation in an operating permit. Typical permit uses may include:

- use within a bubble to reduce costs of meeting current emission limitations;
- use as an offset in a nonattainment area for a planned new or expanded facility; and
- use in an attainment area to meet or avoid prevention of significant deterioration requirements.

Tax issues relevant to the use of an ERC include:

- whether an amortization deduction is available; and
- if an amortization deduction is allowable, what method may be used and over what period is the amortization taken?

Is amortization available when an ERC is used in an operating permit?

An amortization deduction for the cost of an ERC that has been used is allowable if the firm can establish a useful life for the benefits derived from the cost. In analogous cases dealing with intangible rights acquired through government programs, courts have allowed amortization over the life of the tangible asset to which the right relates. Consequently, amortization of ERC costs should be allowed over the life of the operating facility with respect to which the ERC is used.

If amortization is allowable, it would be on a straight-line basis. As an intangible right, the benefit from using an ERC would not qualify for accelerated depreciation or 60-month rapid amortization.

7. Government Subsidies and Grants of ERCs

One potential method of securing ERCs in a nonattainment area is from grants from the state or local air pollution control agency or economic development agency. The air pollution control agency could mandate emission reductions from each business in the area or from particular industries in order to secure a government-owned reserve of ERCs (i.e. a growth margin or a community held pool of ERCs) which may be made available to new or existing sources. The public body may then contribute an ERC to a firm as an inducement for the construction or expansion of a plant in a particular location or to prevent loss of jobs through the shut-down of an existing source. One notable example of an offset grant is the creation and acquisition of ERCs by the state of Pennsylvania followed by a contribution of the ERCs to Volkswagen to secure the location of a new manufacturing plant in Pennsylvania.

Government subsidies also can be an important source of public financing of emission reductions. A government agency could seek to reduce emissions in its area by subsidizing a private firm's cost of reducing emissions.

The principal issue with respect to government subsidies and grants of ERCs is whether the subsidy payments or grants represent gross income to the recipient for tax purposes.

Will a firm be taxed on subsidy payments or grants of ERCs received from government agencies?

A source should not be taxed on government grants made to induce the construction and installation of abatement equipment if the grant constitutes a "contribution to capital." Under rules established by the Supreme Court, tax-free contribution to capital treatment may be available where:

(1) the recipient is a corporation;

(2) the recipient acquires ownership of the control equipment; and

(3) the grant proceeds are used exclusively to purchase the equipment.

In contrast, government grants subsidizing the cost of operating and maintaining the pollution control equipment probably will be taxable. Although government grants will not be taxed, the tax basis in the equipment acquired will be reduced by the amount of the grant. Thus, the firm will receive a reduced benefit for its depreciation or rapid amortization deductions. A government grant of an ERC to a corporate-recipient also can qualify as a tax-free contribution to capital, but only if the ERC actually is used by the recipient. A grant of an ERC or subsidy payments made to an individual businessman or partnership probably will be taxable. The amount included in taxable income would be the fair market value of the benefit received, whether it is the ERC or subsidy payments.

8. Leasing Transactions

Where permitted by banking rules, ERC leasing may play an important part in the controlled trading program. For example, ERC leasing could be used in a situation where an emission reduction is needed to meet control requirements at a facility with a limited remaining useful life. In this case leasing an ERC for five years may be more economical than retrofitting the facility.

In addition to leasing ERCs, a firm could also lease control equipment to create the underlying surplus emission reduction.

The primary tax benefit to the firm leasing the ERC or control equipment is the deductibility of rental payments. For tax planning purposes, the primary tax consideration is to ensure that the IRS will not recharacterize the transaction as a sale transaction. In any leasing transaction care should be taken in structuring the arrangement so that tax benefits and burdens are distributed as intended by the parties.

When will the IRS treat a lease transaction as a sale?

The IRS has stated that it may recharacterize a lease as a sale transaction where one or more of the following conditions are present:

- portions of the periodic payments are applied for the acquisition of the property by the lessee;
- the lessee will acquire title upon the payment of a stated amount of "rentals" which under the contract it is required to make;

- the total amount which the lessee is required to pay for a relatively short period of use constitutes an inordinately large proportion of the total sum required to be paid to secure the transfer of the title;
- the agreed "rental" payments materially exceed the current fair rental value;
- the property may be acquired under a purchase option at a price which is nominal in relation to the value of the property at the time when the option may be exercised, as determined at the time of entering into the original agreement, or which is a relatively small amount when compared with the total payments which are required to be made; or
- some portion of the periodic payments is specifically designated as interest or is otherwise readily recognizable as the equivalent of interest.

The consequences of IRS treatment of the lease transaction as a sale would be that "rental" payments would be considered payments made for the purchase of the pollution control equipment or ERC and would not be deductible by the source using the asset. Thus, in an equipment leasing transaction, the "lessor" would not be treated as the owner of the equipment for investment tax credit, depreciation and 60-month rapid amortization purposes. These tax benefits would be reallocated to the firm using the equipment.

In summary, any financing alternative that contemplates a continuing leasing arrangement between the parties must be carefully structured to ensure that the company that is intended to benefit from the depreciation or amortization deduction and investment tax credit will be recognized by the IRS as the owner of the property.

VII. Conclusion

This paper has examined a number of critical tax issues that arise in the context of ERC transactions. Consideration of these tax issues will be an important factor in the financial desirability of participating in controlled trading activities. Brokers can provide an important service to their clients by maximizing their tax benefits in structuring the financing and sales agreements, both at the time an ERC is created and at the time it is sold or used.

Few of the issues discussed in this paper have been clearly resolved by IRS rulings. In several instances, existing IRS rulings involving other government programs are sufficiently analogous to provide some guidance in ERC transactions. Final resolution of other major issues (e.g., industrial development bond financing) will have to await examination by the IRS.

BUBBLE POLICY FACT SHEET

Bubble Applications:	60 (as of 1/15/81)
Total Expected Savings:	$200 million by end of 1981
Average Savings:	$1 - $2 million
First Bubble Approved: (1-12-81)	Narragansett

Example of Cost Savings:

Narragansett Electric Co. (Providence, R.I.)	$3m/yr.
E.I. DuPont (New Jersey)	$12m in initial capital
Potomac Electric Co. (Washington, D.C.)	$4m/yr.
Minnesota Mining $ Mfg. Co. - 3M (Bristol Pennyslvania)	$3m in initial capital $1m - $2m/ yr.
U.S. Steel Co. (Fairless Pa.)	$15 in initial capital
Armco (Middletown, Oh)	> $10m in initial capital

EXAMPLES OF EXPENDITURES TO CREATE AND PURCHASE EMISSION REDUCTION CREDITS FOR USE AS OFFSETS

Firm	# of Tons Received/yr	$	$/Ton
Volkswagen received donated ERCs from BP Oil, Season All and Moly Climax. Location: PENNSYLVANIA	444 Tons of HC	$250,000	$563
Marblehead Lime Co. paid the cost of paving a road within the confines of a National Steel Co. plant. Location: MICHIGAN	50-100 Tons of TSP	$50,000	$500-1000
City of Columbus Ohio compensated Aggnegated Rock Corp, Columbus Bituminous and an undisclosed company for the costs they incurred in adding pollution control equipment and raising stack heights at their facilities. Location: OHIO	9000 Tons of TSP	$410,000	$45

General Motors received donated ERCs from the Sun, Champlin, Continential and APC Oil Companies. Cost data was only available for the ERCs donated by Champlin. Location: OKLAHOMA	1230 Tons of HC	$200,000	$163
General Portland Inc. paid for the cost of designing and installing control equipment at Parkers Brothers, a nearby limestone operation. Location: TEXAS	1013 Tons of TSP	$375,000-$520,000	$370-$513
Wickland Oil Corp paid the City of Paris Dry Cleaners to renovate its facility. Location: CALIFORNIA	73 Tons of HC	$25,000	$342

APPROVED AND/OR PENDING BUBBLE, OFFSET AND BANKING TRANSACTIONS

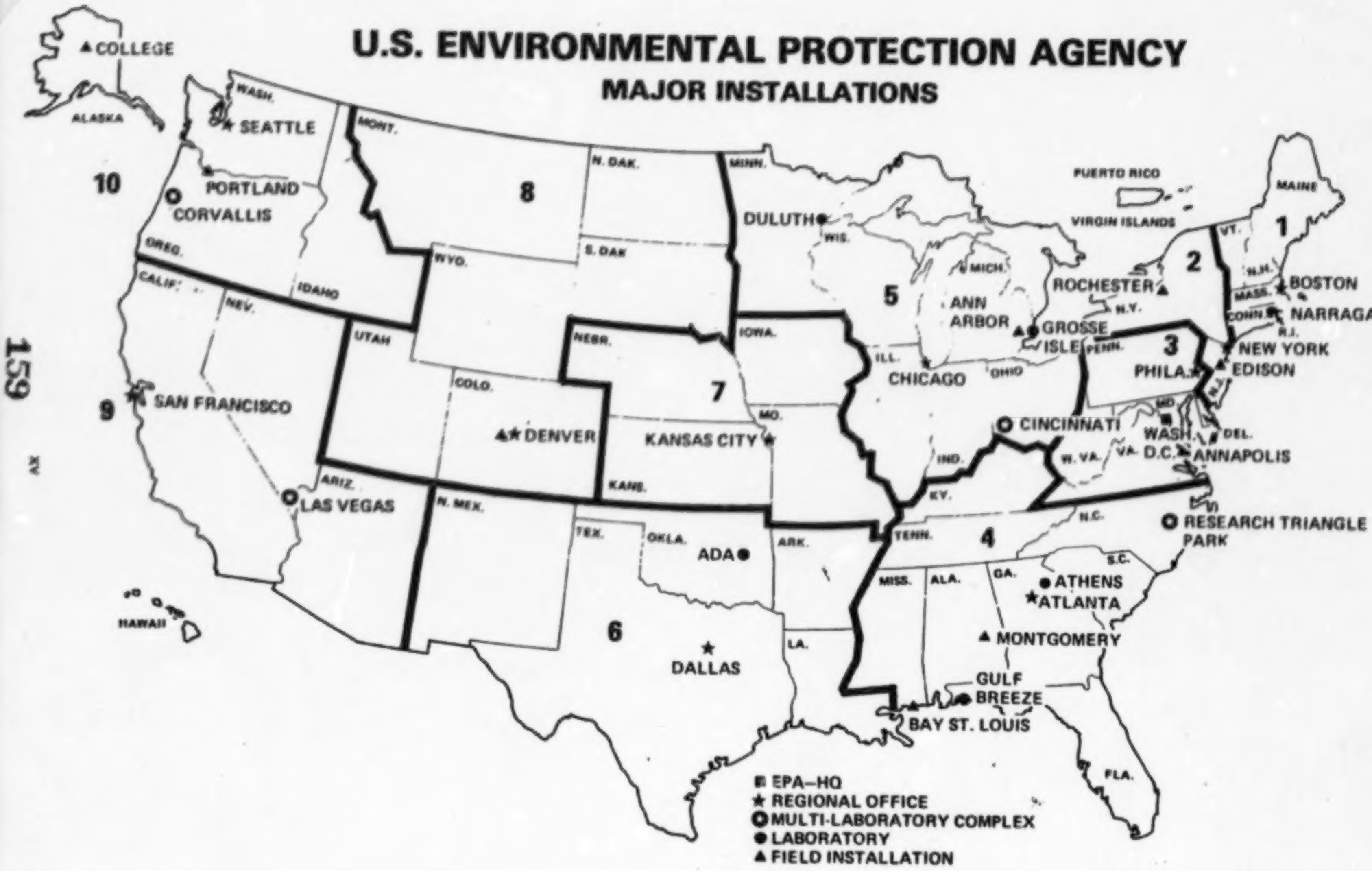
		OFFSETS		BUBBLES	BANKING
		I	X*		
US		620+	32	64	100+
Region	I	8	0	3	1
	II	4	0	6	30
	III	9	5	12	
	IV	16	2	10	20
	V	60	11	24	17
	VI	8	5	6	
	VII	4	1	1	2
	VIII			1	
	IX	503+	7	1	+
	X	5	1	1	92

* I/X= I denotes those transactions that involve only reductions generated within the corporate holdings of a firm; X indicates that the transaction occurred between two distinct firms.

Sources: Data set compiled by Wes Vivian at the Institute of Public Policy Studies, University of Michigan, Ann Arbor; and EPA Regions.

U.S. ENVIRONMENTAL PROTECTION AGENCY

MAJOR INSTALLATIONS


COLLEGE
ALASKA
HAWAII
PUERTO RICO
VIRGIN ISLANDS
10
9
8
7
6
5
4
3
2
1
WASH.
SEATTLE
PORTLAND
CORVALLIS
OREG.
CALIF.
NEV.
IDAHO
MONT.
WYO.
UTAH
COLO.
ARIZ.
N. MEX.
N. DAK.
S. DAK
NEBR.
KANS.
MINN.
IOWA.
MO.
OKLA.
TEX.
ARK.
LA.
WIS.
MICH.
ILL.
IND.
OHIO
KY.
TENN.
MISS.
ALA.
GA.
FLA.
S.C.
N.C.
VA.
W. VA.
MD.
DEL.
PENN.
N.Y.
N.J.
VT.
N.H.
MAINE
MASS.
CONN.
R.I.
SAN FRANCISCO
LAS VEGAS
DENVER
KANSAS CITY
ADA
DALLAS
DULUTH
CHICAGO
ANN ARBOR
GROSSE ISLE
ROCHESTER
CINCINNATI
PHILA.
WASH. D.C.
ANNAPOLIS
NEW YORK
EDISON
BOSTON
NARRAGANSETT
RESEARCH TRIANGLE PARK
ATHENS
ATLANTA
MONTGOMERY
GULF BREEZE
BAY ST. LOUIS
■ EPA—HQ
★ REGIONAL OFFICE
○ MULTI-LABORATORY COMPLEX
● LABORATORY
▲ FIELD INSTALLATION

REGIONAL OFFICES AND REGIONAL ADMINISTRATORS

REGION I

William R. Adams, Jr.
John F. Kennedy Federal Building
Room 2203
Boston, Massachusetts 02203
Phone: FTS - 223-7210
CML - 617-223-7210
Hours: 8:00-5:00

REGION II

Charles Warren
26 Federal Plaza
Room 900
New York, New York 10007
Phone: FTS - 264-2525
CML - 212-264-2525
Hours: 8:00-5:00

REGION III

Jack Schramm
Curtis Building
6th & Walnut Streets
Philadelphia, Pennsylvania 19106
Phone: FTS - 597-9814
CML - 215-597-9814
Hours: 8:00-4:30

REGION IV

Rebecca W. Hanmer
345 Courtland Street, N.E.
Atlanta, Georgia 30308
Phone: FTS - 257-4727
CML - 404-881-4727
Hours: 8:15-4:45

REGION V

John C. McGuire
230 South Dearborn Street
Chicago, Illinois 60604
Phone: FTS - 353-2000
CML - 312-353-2000
Hours: 8:15-4:45

REGION VI

Adlene Harrison
First International Building
1201 Elm Street
Dallas, Texas 75270
Phone: FTS - 729-2600
CML - 214-767-2600
Hours: 8:00-4:30

REGION VII

Kathleen Q. Camin
324 East 11th Street
Kansas City, Missouri 64106
Phone: FTS - 758-5493
CML - 816-374-5493
Hours: 7:00-4:30

REGION VIII

Roger L. Williams
1860 Lincoln Street
Denver, Colorado 80295
Phone: FTS - 327-3895
CML - 303-837-3895
Hours: 7:00-5:30

REGION IX

Paul DeFalco, Jr.
215 Fremont Street
San Francisco, California 94105
Phone: FTS - 556-2320
CML - 415-556-2320
Hours: 8:00-4:30

REGION X

Donald P. Dubois
1200 6th Avenue
Seattle, Washington 98101
Phone: FTS - 399-1220
CML - 206-442-1220
Hours: 8:00-4:30

Washington Post 8/18/80

Selling the Right to Pollute

MARYLAND'S Economic Development and Community Administration has asked the General Assembly to consider a proposal that would allow businesses in the state to buy, sell and trade the right to pollute the air. If the plan is eventually adopted, it would likely make Maryland the first state to try out what amounts to a revolutionary idea in pollution control.

The plan has been largely developed by the federal Environmental Protection Agency in its search for ways to bring down the cost of pollution control—which will otherwise inevitably rise as the economy grows. In industrialized, polluted areas, such as parts of Maryland, a way also had to be found to avoid an imminent choice between economic stagnation and unsafe air. Allowing industries to earn pollution credits should, EPA reasoned, help solve this problem in two crucial ways.

The ability to build up pollution credits would, for the first time, give industry an incentive to remove more pollution than the regulatory minimum. This would create a pool of clean air that could be used by a new plant or expansion of an existing business. It would mean that if one business could remove sulfur, for example, at a cost of a few cents per pound, it could sell the pollution it didn't release to another business whose sulfur removal might cost a dollar per pound. Under the proposed rules, which would require that every trade result in cleaner air, the first business could suddenly find itself transformed from an environmental polluter to a pollution controller, making a healthy profit in the process.

The new plan would also give industry a powerful profit motive to develop new pollution control technologies that could drastically reduce costs. There is an urgent need for such innovation, for although most of today's technologies are relatively primitive and expensive to run, little research—except that paid for by the federal government—is going on. The reason is simple: research costs a lot of money, and federal standards that tell a business exactly how much pollution it may emit, and how it should be controlled, remove most of the incentive to remove more or to do it more cheaply.

In considering the new proposal, the General Assembly will find itself wrestling with a lot of questions for which there are no tried and tested answers. Should the state be able to acquire and dispose of pollution rights? How should sales of pollution credits be taxed? How can the program be monitored to ensure that the air does in fact get cleaner? How, under this plan, would Maryland interact with its neighbors? And these are just a few.

But these admittedly formidable problems should not dissuade the legislators from giving the proposal a thorough hearing—all truly new ideas, even the best, can look impossibly difficult at the beginning. Government regulations are generalizations—designed to manage broad problems, not to fit specific situations. In theory at least, a free market in pollution rights offers a more flexible and economically sensible alternative yielding more pollution control at less cost. If Maryland can solve the many administrative problems, it seems a worthwhile experiment.

WALL STREET JOURNAL 12/19/80

Pennsylvania Industrial EMISSION CREDITS FOR SALE

750 tons of hydrocarbon emissions per year which can be used as offset credits for a new or modified source within 40-mile radius of CONSHOHOCKEN, PENNSYLVANIA in southeast Pa. Air Basin. Write or call:

GOODYEAR
REAL ESTATE DEPARTMENT

1144 E. Market Street,
Akron, Ohio 44316
Tele: 216-796-2238—
J. A. Armstrong

For more information on controlled trading, please contact:

Michael Levin
Chief, Regulatory Reform Staff
U.S. Environmental Protection Agency (PM-223)
401 M Street S.W.
Washington D.C. 20460
(202) 287-0750

For more information on brokering, please contact:

Denise Thal
Regulatory Reform Staff
U.S. Environmental Protection Agency (PM-220)
401 M Street S.W.
Washington, D.C. 20460
(202) 287-0711